SPECIAL ISSUE—BUSINESS FLYING OUTLOOK

FLYING

THE WORLD'S MOST WIDELY READ AVIATION MAGAZINE

OCTOBER
50¢

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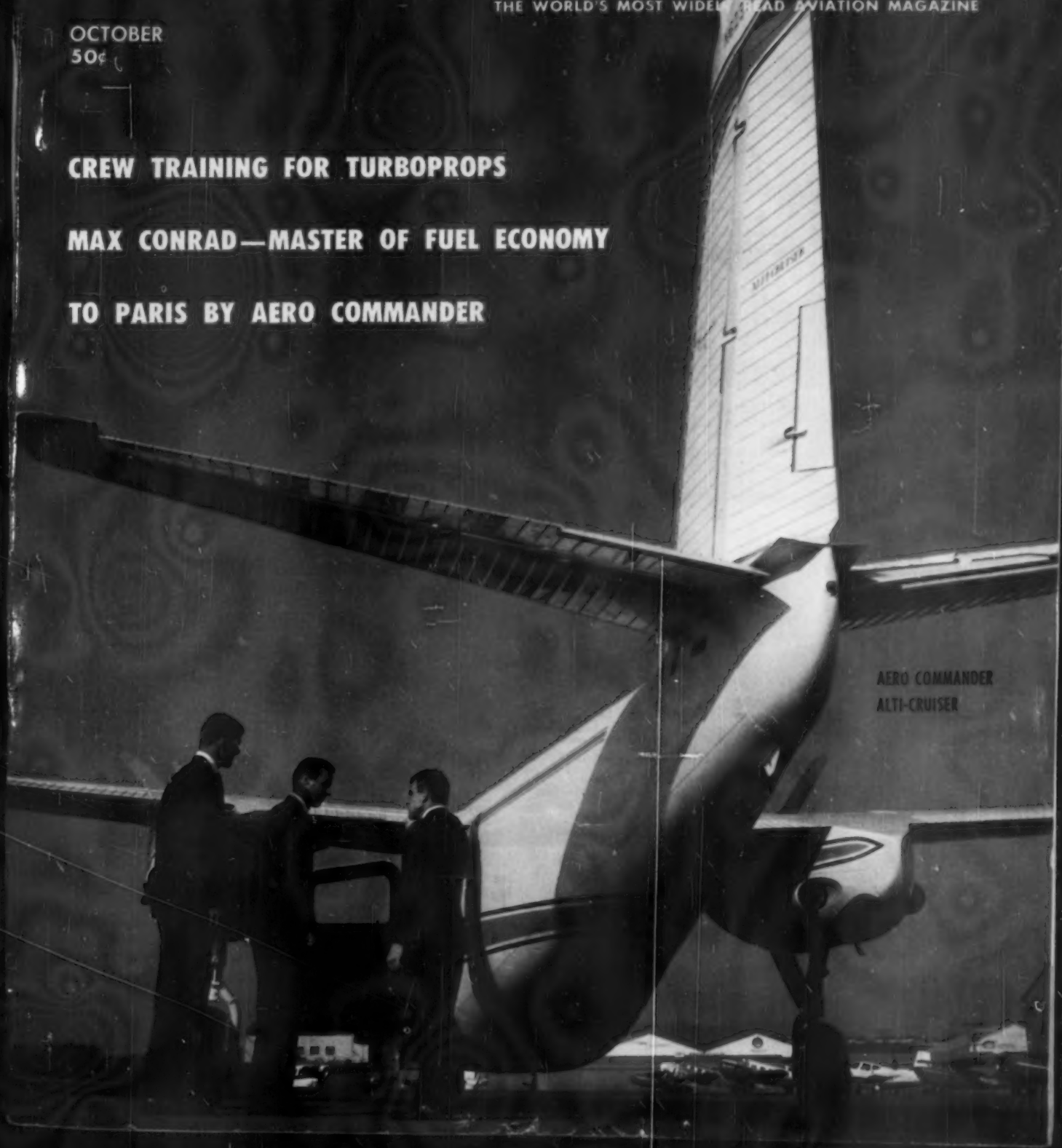

Esso

WING TIPS

DON'T BE DECEIVED. Being surrounded by mountains produces illusions which could be dangerous. One is using a distant mountain for a horizon. The danger is that you're likely to keep pulling up the nose till you stall. Be safe – check air speed and altimeter regularly in this situation.

BE A "MUDWATCHER". Sudden downpours are likely to create hazardous taxiing situations for the pilot. Innocent-looking puddles may cover a virtual quagmire which will nose over many a light plane or even a twin engine ship. So when taxiing – be wary – be wise – beware – of mud!

BEWARE OF "T" CLOUDS. Big Chief Thunderhead will have your scalp if you unwittingly cross his path. Violent updrafts and downdrafts, skin-tearing hailstones and the usual lightning and rain may be your downfall if you decide to risk it. Even the overhang is treacherous, never fly near it. Either go around or beat a safe path home.

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FLYING®

OCTOBER, 1959 VOLUME 65, NUMBER 4

CONTENTS

Editorial: The Fable of Horatio Alger and His Father 28
Business Flying Outlook . . . . . *Franklin D. Walker* 30
Air Leaders Cite Business Flying Progress 33
To Paris by Aero Commander . . . . . *Cecile Hamilton* 34
Transition to Turbines . . . . . *Lou Davis* 37
The Airman's World . . . . . *Gill Robb Wilson* 40
Why We Entered the Business Plane Market . *Col. Willard F. Rockwell* 42
Socony Mobil's Flying Red Horses . . . . *Capt. Charles E. Morris* 44
How Raytheon Makes Travel Time Working Time . *Charles F. Adams* 46
Pay as You Fly . . . . . *John R. Graham* 48
Straw in the Wind . . . . . *A. L. Hosford* 50
An Indispensable Business Aid . . . . . *Jan Bogardus* 53
How Atlantic Aviation Serves Business Flying . . . *Alex Dawydoff* 54
When You're High, Use Oxygen . . . . . *Arthur E. Miller* 57
The Ayer Story . . . . . *Richard Hammer* 58
The Pro's Nest: Fuel Economy . . . . . *Ted Durosko* 60
Max Conrad, Master of Fuel Economy 61
Small Planes and Big Jobs . . . . . *L. C. Pennypacker* 64
Clear That Title! . . . . . *Kendall K. Hoyt* 66
I Learned About Flying From That!, No. 236 . . . . . *Hans Bannies* 68

FLYING FEATURES

Mailbox 6
Briefings 10
Hangar Flying 15
Have You Read? 18
Flying Calendar 24
Overnight Stop, No. 54 84
Picture Credits 114
Advertising Index 121

THE COVER: Lensman Don Downie caught the graceful sweep of the Alti-Cruiser, pressurized version of the Aero Commander 680E.

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A NEW HIGH IN HIGH EFFICIENCY

New Cessna 310C climbs faster on one engine than any other light twin

Now in 1959, the new *High-Efficiency* 310C once again proves its superiority over any other light twin in a crucial test of power and safety. It climbs on *one* engine at 440 feet per minute—*with five passengers!*

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High-Efficiency appears prominently in the newly designed interior, too. You get *five* choices of seating arrangements . . . in a cabin so spacious you can relax in a fully reclining lounge! And within the luxurious cabin, you can work, talk, or nap in club-room quiet. A remarkable new muffling system in new, longer engine nacelles mutes engine sounds to a low hum.

Be sure to try all the *High-Efficiency* features of the new Cessna 310C. Price: $59,950 f.a.f. Wichita. Call your Cessna dealer now (Yellow Pages of phone book). Look at all *seven* great Cessna models. Also ask your Cessna dealer about lease plans. Or write: Cessna Aircraft Company, Dept. F-12, Wichita, Kan.

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Another

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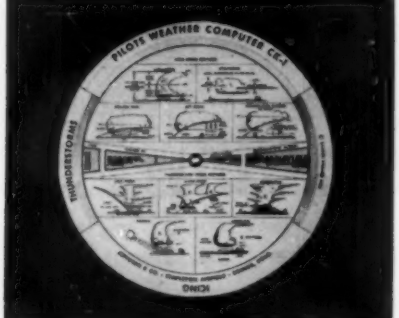

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MAILBOX

OWNER-PILOT MAINTENANCE RATING?

I am an airplane owner and pilot. I've been flying for about 15 years—as a civilian. My present plane is a Luscombe 8-E.

I would like to see some attention given to the problem of flyers of my class who are not financially immune to the restrictions imposed on us by the present Federal maintenance and repair regulations.

First, I have never found it necessary to patronize repair and maintenance stations with regard to the successful operation of any of the mechanized equipment, including my car and truck, used for many years in the operation of a modern farm. Yet it has been a constant uphill battle for me to provide adequate maintenance for my airplane, because of the rules prohibiting me from personally performing the various repair and maintenance operations necessary for the safe and economically feasible operation of my airplane . . .

I have nothing but the highest respect for the people appointed to administer the present rules (but) let's make the job a lot easier for them by allowing the people who are legally and morally responsible for the safe operation of their aircraft to personally attend to repair and maintenance problems, provided that they are able to demonstrate their personal capabilities or subject their efforts for rigid inspection.

This could be done by minor modification of the present system. If inadequacies, irregularities, or violations were found prompt steps, such as fines or other means similar to methods used in policing the automobile field, could be used.

Let's have an Owner-Pilot Maintenance Rating.

VERNON J. DAVID

Durham, Kan.

• *Here's one for the FAA.—Ed.*

FLICKER VERTIGO

Inasmuch as I was a victim of this in 1953, I have read with great interest the article "Flicker Vertigo," by Scholer Bangs in the July issue. There is one misstatement, however, which says that you will not lose your license. I did.

I was on a checkout flight in California and, while taxiing, I was knocked unconscious by the flickering light through the idling prop. When I woke up the plane had been brought to a stop by the instructor and I had been lifted out of the ship by spectators. The CAA Medical Officer relieved me of my license and classed the incident as an epileptic attack. . . . It took three encephalograms, one set of X-rays, five physicals, red tape and 2½ years to get that license back. I even had one doctor tell me I had a brain tumor. . . .

I would suggest that your article be clipped and kept as proof that there is such a thing as flicker vertigo.

NAME WITHHELD UPON REQUEST

. . . This article may save many a hapless non-Air Force pilot from confusion which might end in disaster. Bravo!

MICHAEL SALSBERY

Erlanger, Ky.

TO SEE IS TO APPRECIATE

I read "Riding the Temco Pinto" by Norman Jacobshagen in your July issue. He did a real fine job describing the TT-1. You have to see one and be able to get near it to really appreciate it. They are real beauties. Here at the Naval Air Station in the crash crew we get to know some of the different types of aircraft,

that fly here. We like the TT-1 as we feel it is more our size.

Unfortunately, the particular TT-1 shown on Page 41 in the magazine crashed here. The pilot, LCDR George S. Burdick was fished out of the water unharmed and cause of the mishap while on a test flight is still under investigation.

I have taken FLYING for the past three years and whenever I finish my copies, I take them down to the Crash Crew and they make the rounds. We like the articles fine, especially "I Learned about Flying From That." Some of us are private pilots and like to talk over our experiences.

FRED M. STOW SR.

Patuxent River, Md.

RED CARPET TREATMENT

I enjoyed reading the article on flying to Alaska via the Alcan Highway by Lt. Col. Bob Crawford in the August issue. Having just completed that trip with the Flying Physicians, I wish to take issue with one statement the author made.

He stated it would be a good idea to check your airplane at Great Falls, Mont., as you would not find a good mechanic until you reached Fairbanks, Alaska. On the contrary, the FPA's were afforded very fine service at Gateway Service at Edmonton (Alberta) International Airport. These folks at Gateway really

(Continued on page 8)

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Veterans: Check here ☐ for Special Veteran Training Information.

MAILBOX

(Continued from page 6)

rolled out the red carpet. They parked the 50 airplanes in our group, serviced them, did the necessary mechanical work, helped us with our emergency gear, provided courtesy car service, helped us with weather briefings and even offered to work all night to install an ADF for some of us who got worried about those long stretches ahead. And all at moderate prices!

E. C. Felton, M.D.

Laramie, Wyo.

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Carl Stephens

84-17 Jamaica Ave.,
Woodhaven, L. I., N. Y.

AVIATION IN THE ARMY

Have just finished reading the article "Wings for the Army Guard" in August Flying. It is really a fine article. However, I find no mention that the same opportunity for pilots exists in the Army Reserve as well as the Guard. In fact, more opportunity for pilots who are not commissioned and want to fly in the Reserve due to the opening of the cargo helicopter program to qualified enlisted men, who will graduate as Warrant Officers.

At the present time in New York City area alone, we have an Aviation Company, the 77th Aviation Company of the 77th Infantry Div., of which I am a member, and a Helicopter Co., an independent unit.

Thanks again for a fine article that explains to the public the job of Army Aviation.

Arthur S. Bauer

Astoria, N. Y.

WINGS FOR THE ARMY GUARD

Lest the Army Guard be criticized for claiming much more than it is due, I would like to correct an error—a slip of the typewriter, no doubt—in paragraph three of my article "Wings for the Army Guard" in the August issue.

It is not 50-60 hours, each, per month that the four Army Guard pilots and ground personnel put in at Taylor Airport as the article stated, but 50-60 *man* hours each week at their duties, including the 40 hours per week put in by the full-time mechanic.

William V. Kennedy

Camp Hill, Pa.

A PLEA FROM TULSA

In answer to my request a while ago for help in collecting back issues of Flying you sent me names of three fellows who had back copies for sale. Through these sources I have obtained some of the issues I needed.

However, I am in need of the following few issues to make my bound volumes complete from 1938 to 1958:

1939—Feb., May, Oct., Dec.
1940—Apr., May, Sept.
1946—Sept.
1947—Feb., Mar.

If you could put me in touch with any other sources I would appreciate it. Also, in my collecting and trading of magazines I have obtained over 100 extra copies of Flying from the year 1953 to 1959 and would be glad to trade for issues I need.

Geo. E. Goodhead, Jr.

6326 E. 4th St.,
Tulsa 12, Okla.

HARD TO FIND

Like getting an unexpected present is finding a good restaurant on a small airport—with all due respect to candy-bar and soft drink machines which have tided many of us over lots of mealtimes.

At Ottawa, Ill., opposite the airport office, is a fine restaurant with a collection of model airplanes fascinating to any flier. There are over 50, no two alike,

suspended from the ceiling. Bob Goetz, who keeps the place open from 6 a.m. to 12 p.m., seven days a week, says he has lots more to put up when he can find space for them. His pretty Japanese warbride, Peggy (who can't drive a car yet) is in charge of the restaurant when she isn't taking a flying lesson.

K. Clifton

Watseka, Ill.

NEW CANADIAN PORT OF ENTRY

Just wanted to tell the pilots of the North-country that Cartierville Airport in Montreal is now a Port of Entry for private aircraft. Customs duty hours are 8:00 a.m. till sundown daily and no special fees are applicable on weekends. Montreal Flying Club next door has Esso products; also a direct telephone link with the control tower. Transportation to the city is easily available.

An ADCUS notice on your flight plan from Burlington, Vt., or Massena, N.Y., is sufficient warning but make sure to show Cartierville as destination. Primary frequency of tower is 118.7. They also transmit on 396 while guarding 122.5 and 3023.5 in addition to 121.5. The airport has three hardsurfaced runways, no lights. Note: lefthand pattern applies for runways 06, 10 and 15, while 24, 28, and 33 demand a righthand circuit.

Stefan I. Hess

Lachine, Que., Canada.

FRENCH FLIERS CONQUER ANDES!

MERMOZ AND COLLENOT LINK ARGENTINA, CHILE!

Santiago, Chile, Feb. 2, 1928—The first successful commercial flight over the Andes mountains between Argentina and Chile was completed today when Jean Mermoz and Alexandre Collenot landed their Laté 25 monoplane at Copiapo, Chile, after a 900-mile flight from Buenos Aires, Argentina. The intrepid airmen overcame sub-zero temperatures and radiator difficulties to pave the way for a regular commercial air service between the two countries.

FIRST IN INTERNATIONAL AIR TRAVEL! Since the very beginning of international flight, the exploits of French aviators like Blériot, Bossoutrot, Noguès and Mermoz have made aviation history. Air France is proud to continue this tradition of French leadership in aviation by offering the most non-stop flights both ways between New York and Paris and the fastest jet service between Europe and the Middle East. And next year Air France will put into operation one of the largest pure jet fleets in the world.

AIR FRANCE

WORLD'S LARGEST AIRLINE/WORLD'S FIRST INTERNATIONAL AIR SERVICE

Briefings . . .

OMEGA AIRCRAFT CORP., of New Bedford, Mass., has signed a $200,000 contract with Okanagan Helicopters, Ltd., Vancouver, B. C., for the sale of three SB-12D twin engine helicopters. Okanagan is now

undertaking an intense study in the application of this, the largest of commercial helicopters, in the application of this machine to passenger service. Delivery of the first Omega is scheduled for early 1960 and the other two later in the spring.

BEECHCRAFT MODEL 33, a new four-place, single-engine airplane in the $20,000 bracket is joining the Beech Aircraft popular line of executive aircraft in 1960. Having a general contour similar to the Bonanza, but with conventional tail and a swept-back vertical stabilizer, its gross weight is somewhat lighter than a Bonanza; its engine rated at less horsepower. The first prototype was scheduled for test flight as this issue of FLYING went to press.

VOLUNTARY PILOT REPORT of near mid-air collisions, under SR 416, has been rescinded by FAA and the CAB. Originally established by the Board in Feb. 1956, the system, according to CAB, has already yielded all the useful information which it is capable of producing for the time being. Henceforth FAA will follow its normal investigative procedures for handling all other safety reports.

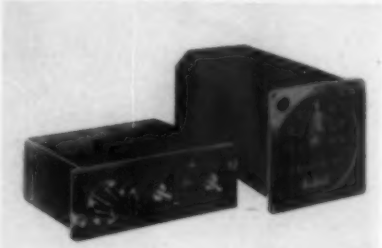
AIRWORK CORPORATION, lately appointed distributor and overhaul station for the Rolls Royce Dart turboprop engine, is establishing a completely new shop for the overhaul, repair and testing of all models of the Dart. The engine accessories will be serviced and tested in their new jet facility. This overhaul contract with Airwork augments the already existing service facilities available for Dart-powered Fairchild F-27, Vickers Viscounts and Grumman Gulfstream aircraft which operate in the U. S.

SHOWN FOR THE first time in flight this pair of Northrop (Norair Div.) Aircraft T-38 Talon, supersonic training planes developed for the Air Training Command, has earned the reputation of

being the "busiest aircraft at Edwards AFB, Calif." Powered by two GE J-85 turbo jet engines, the T-38 is one of a new family of multi-purpose designs now in the works at Northrop. Another, the N-156F Freedom Fighter, is also under flight test at Edwards.

WHEN ITALY recently marked the 50th anniversary of the first flight of an Italian aircraft—by Aristide Faccioli and his son Mario—part of the ceremonies included dedication of the Turin Aero Club's new Eduardo Agnelli field on the outskirts of the city. More than 100 planes, representing all the Italian aero clubs, flew in for the dual celebration sponsored by the Turin-Aero Club.

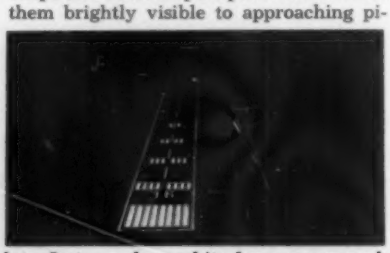
LONG ANTICIPATED, General Precision Laboratories of Pleasantville, N. Y. has announced that it is entering the market with its new lightweight self-contained doppler navigation system for busi-



ness and commercial aircraft. Comprised of the RADAN 500 doppler radar and TCN-50 track navigation computer, this system operates independently of ground installations over all types of terrain, in all weather; anywhere in the world. Transistorized, the 68-pound Radan 500 equipment consists of a 3/8 ATR short transmitter/receiver, a 3/4 ATR long frequency tracker; indicator and control panel, and an antenna. The computer, 23 lbs., has a 1/2 ATR short computer-amplifier and control panel. Control panel and indicator of Radan 500 is pictured above; TCN-50 control panel below.

OPERATION OF portable radios and other electronic devices, excluding hearing aids, by passengers on the international airlines has been banned as a safety precaution by the International Air Transport Association. These devices when switched on in the main cabin of an airliner have been found to affect indicator instruments of radio aids in cockpit.

MINNESOTA MINING and Manufacturing is offering, under the tradename of "Scotch-Rok," a reflective aggregate which, when applied to runways, taxi strips and other airport pavements makes them brightly visible to approaching pi-



lots. In two colors, white for runways and yellow for other areas, aggregate is applied at a rate of four pounds per gallon of the recommended binder, each gallon covering 80 sq. ft. of surface. Write the company at St. Paul, Minn.

TEN YEARS REMOVED from the field of flight instruction, Remmert-Werner, St. Louis, has re-established pilot training at Lambert Field with courses especially designed to meet the needs and

(Continued on page 122)

Mobil — FLY WEATHER-WISE

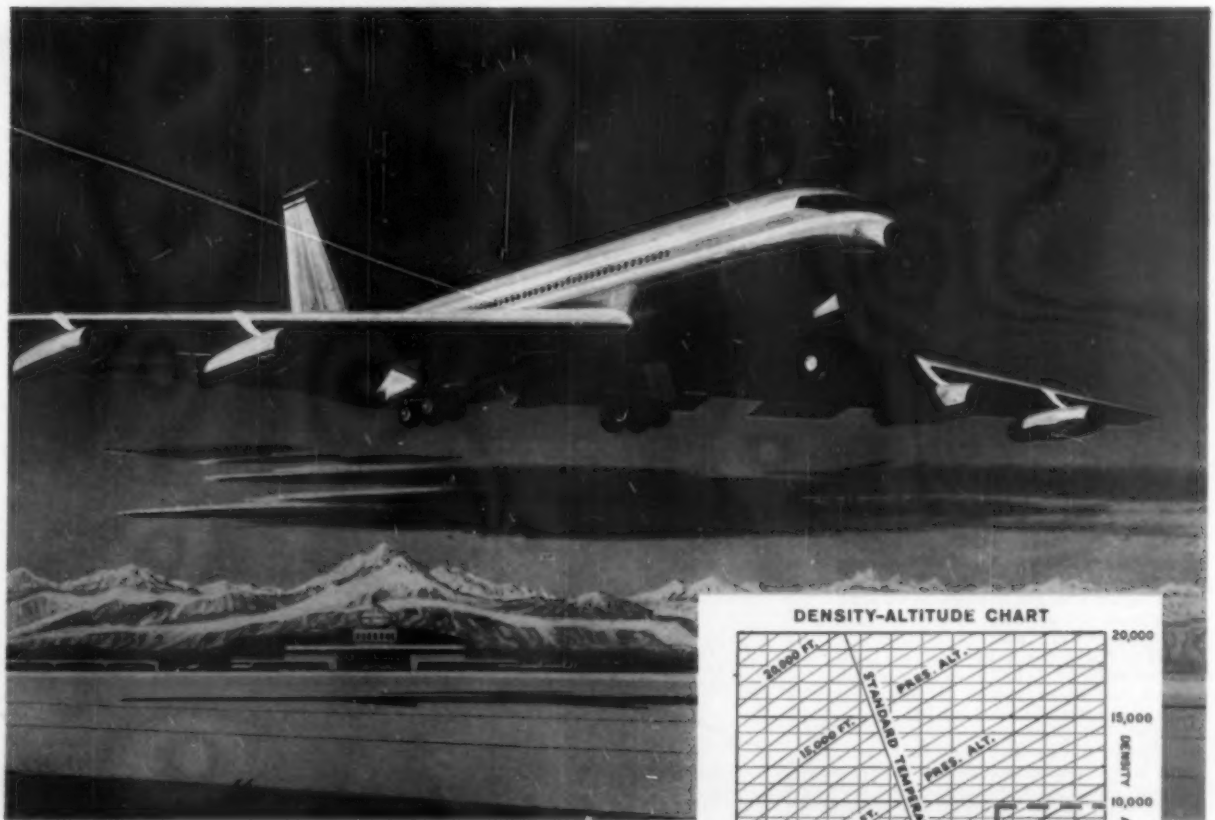
AIR DENSITY

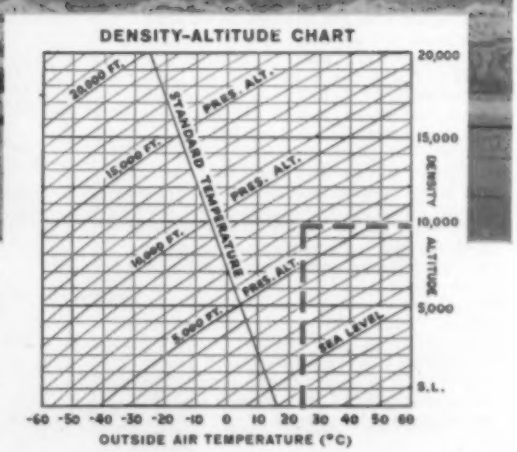
EFFECT ON FLIGHT

These weather items prepared in consultation with the United States Weather Bureau

Air density plays an important part in the take-off and flight performance of today's gas-turbine aircraft. Low densities reduce engine thrust and aerodynamic lift. Since density decreases with altitude, the higher the altitude the longer the take-off run. Therefore the density at airport altitude (Density-Altitude) is an important factor in calculating maximum fuel load and pay load. Barometric pressure and ground air temperature affect density. As both are continually changing, the Density-Altitude of the airport continually changes—may vary as much as several thousand feet a day.

Density-Altitude can be determined by knowing barometric pressure (at airport, not sea level) and temperature. Charts similar to the one below can be used.





Charts like this are useful in determining Density-Altitude. The Pressure-Altitude (reading when altimeter is set at 29".92) and the Temperature at the airport are entered to find Density-Altitude.

Today, more than ever, it is important to select a jet fuel with the right performance over the full range of varying atmospheric conditions. Mobil has developed a complete line of such quality jet fuels—Mobiljet 140, Mobiljet 158 and Mobiljet 476. Fly weather-wise . . . fly Mobil.

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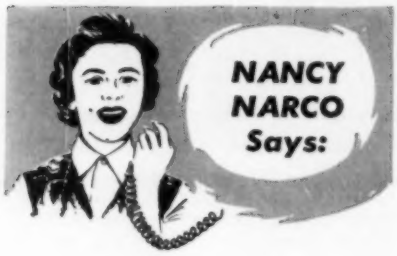

THREE LIGHTS?

Since the Narco engineers dreamed up the little 18-ounce, self-contained, three-light 75 megacycle marker beacon receiver known as the Narco MBT, the reaction has been terrific and the Narco people have set some kind of a production record by grinding out 35 MBT's a day. Couple of thousand MBT's are already blinking merrily in cockpits of airplanes all over the world.

Just in case you're not familiar with a three-light marker beacon receiver, it's quite a helpful navigation aid. When you pass over an LF range station or a fan marker you get a white light blinking at you; over an Outer Marker a blue light; and over the Middle Marker of the ILS an amber light.

Once in a while we run into people who are a little skeptical about the MBT. Some old pros just don't believe you can get a good 75 mc receiver for only $230—less than half the cost of other receivers. Well, all they have to do is talk to DC-3, Lodestar and Twin Beech pilots who've plugged in the MBT and they'll learn that the Narco engineers have pulled a real electronic miracle.

Then there's another group who don't quite see the advantage of a visual marker beacon. They have an aural marker which works fine in their Omnigators, so why bother? Confidentially, I felt the same way myself.

But then I started to think about some approaches I've nearly messed up using an aural receiver. Couple of times the marker was screaming away and I couldn't hear the tower, so I turned off the marker beacon. Then, after finishing my procedure turn I'd grope along the ILS inbound wondering where the Outer Marker was only to realize that I'd forgotten to turn the marker beacon receiver on again.

I figure I've got enough to do with my ears, monitoring approach control, the tower, the ILS localizer. It makes it so much easier and less frantic to see that light blink on and off. And you never, never get any hash from interfering TV signals.

If you VFR pilots think this is way over your heads, take a second look. You, too, can get a lot of navigation assistance from 75 mc beacons. Look at your sectional or WAC charts. You'll see fan markers all over the place which can give you positive position information. When you're approaching an unfamiliar airport you can sound just as professional as an airline pilot reporting over such and such a marker. You're talking the controller's language.

Pardon the "commercial," but a three-light marker beacon receiver is such a handy gadget I just felt I ought to bring up the subject.

Nancy

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Map courtesy Jeppesen and Company, who disclaim any knowledge of "Nancy" fan marker

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The four-passenger Piper Caribbean—150 horsepower version of the Tri-Pacer designed especially for airport operators, flying clubs and private pilots—is also available for '60 with streamlined fairings that increase cruising speed by 4 mph. Here's the most economical airplane to buy and fly... is safely flown at reduced power using as little as six gallons of gas an hour. Price is only a little more than the price of other two-place airplanes... **ONLY $8795.**

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The effortless ease of automatic flight is also yours in the AutoFlite model of the 1960 Tri-Pacer. With Piper's exclusive AutoControl you fly "hands off", hold a precise cross-country heading or make turns automatically, fly with added safety.

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See your Piper dealer or write for **Tri-Pacer or Caribbean brochure, Dept. G-10.**

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FAIRCHILD F-27

FAIRCHILD ENGINE & AIRPLANE CORPORATION

HANGAR FLYING

PLUG TROUBLE

AS RUNWAY 26 at NAS Squantum, Mass., fell away below, the 2,000-hp engine of my F6F Hellcat developed a disconcerting sputtering and a few puffs of white smoke emerged from the cowl flaps. This condition cleared up though, as soon as power setting was reduced from take-off to normal climb.

Four of us were on our way to New Orleans, La., for a one-night visit and I had no desire to have engine trouble now and miss the trip.

Two fuel stops were planned to provide plenty of gas margin and to break up the trip. The first stop was at the Marine Corps Air Station, Quantico, Va., where line service was fast and courteous. Taxiing out for take-off, I remembered the rough spell experienced by the engine at Squantum but, as she checked out fine on the ground, I turned onto the runway and started my run. As the take-off power was reached, the big Pratt & Whitney sputtered and began coughing. Since there was plenty of runway remaining, I delayed retracting the wheels and reduced power. Immediately the engine ran smoothly.

At cruising altitude the air was stable and clear and the steady hum of the powerplant relaxed me and I was enjoying flying at its best.

The runways at NAS Atlanta, Ga., our second fuel stop, are long and, in preparation for take-off, I intended to clear out the engine several times. I was becoming apprehensive and perplexed since each ground check before take-off had indicated no engine malfunction, yet during take-off it ran alarmingly rough.

We spent a pleasant night at our second refueling stop and were looking forward to an easy final leg to NOLA. I did not find the time to have work done on the engine as it would have delayed us. Therefore, I double checked the idle mixture, magnetos and all instrument readings. Everything was normal. Furthermore, the runway was 6,000 feet long and the Hellcat literally jumped off the ground with a normal load. There was still a large part of the runway ahead and the plane was about to be airborne when the sputtering and coughing started. Throttle was quickly retarded to climbing power as soon as the plane was airborne. The unbroken deep-pitched sound of the engine was reassuring and I relaxed, setting my course toward Lake Pontchartrain's shores and the Naval Air Station at NOLA. We arrived right on schedule and were shortly on our way to town.

The town was just as I remembered it, although the excitement of the war years was missing. Remembering the take-off at Atlanta and thinking of our scheduled departure next morning, it occurred to me that it would be a relief to get home and have the engine checked. The runways at New Orleans were adequate for the light N2S Stearman trainers but I had my doubts as to their adequacy for fighter aircraft as I gazed down runway eight's 2,800 feet of concrete. At the far end, undulating in reflected heat, was an ominous-looking factory. So, using my own elaborate preparation to prevent the engine from loading up and in addition a collection of my wingmen's remedies, I taxied out to the runway, and gingerly advanced the throttle. Again the white smoke, the sputtering and the coughing poured out of the engine and it seemed worse than before. A third of the way down the runway the factory loomed straight ahead of me directly in the plane's path. The Hellcat was vibrating and shaking as it became airborne. The runway was half gone, I was sure I would never make it. Chopping the throttle, I dropped onto what was left of it.

I could see the wire fence and the street at the end of the runway as I started hitting the brakes. Why the plane did not nose over only God knows. Finally it stopped a mere ten feet from the fence. Taxiing was useless as both tires blew from brutal treatment. Finally the crash and fire trucks arrived to tow the plane away. Tied down and checked for full power, the engine coughed, missed and smoked as before. The maintenance section decided that the spark plugs were ready for replacement as they would no longer fire under high take-off manifold pressure. No elaborate pre-take-off engine clearing could remedy the condition.

In three hours they had new plugs installed and the engine checked out at full power. It ran like a top. They would not say definitely that I could not have made it over the factory, but as I turned to leave, the chief in charge said: "Sir, I couldn't say that you would have made it over the factory either."

MORGAN C. KNOWLTON

Pittsfield, Mass.

TRUST ONLY YOURSELF

IN 1950 I was attending a small college at the Navy Yard city of Bremerton, Wash. Although a proud owner of a rather fresh private license and brimming with enthusiasm, most of my flying had been of a hangar variety due to lack of ready cash. Consequently, when an opportunity arose to trade my car for the use of an Aeronca Champion, I lost no time in closing the deal. This was the situation when a friend of mine and I arrived at Bremerton airport to fly the Champ.

We did not have too much time, so after a quick check with the plane's owner, climbed in and started the engine. He had assured me that there was a good hour of

(Continued on page 16)

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TRIED AND PROVEN

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Every pilot can afford the TR-102A VHF Communications System at the low price of $229. Budget terms are available as a convenience to pilots who prefer to purchase on low monthly terms. As little as $45 down delivers with up to 18 months to pay.

A PRECISION INSTRUMENT . . . 23 channel VHF transmitter . . . long range VHF rece.ver tunes 102 to 128 MC . . . compact and light weight . . . performs satisfactorily in planes without shielded ignition . . . generator not necessary . . . operates in fabric planes. COMES COMPLETE with power supply, VHF whip antenna, 2 crystals (122.5 Tower & 121.5 Emergency). Additional crystals factory installed and adjusted, $10 each.

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☐ I enclose full payment $_____, ☐ Send C.O.D.

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Hangar Flying

(Continued from page 15)

gas in the tank; I in turn understood a "good" hour to mean an hour with a safe margin and took off without checking the fuel.

Climbing out over the outskirts of Bremerton, we swung gradually into a southerly heading and, after half an hour of very enjoyable flight, decided to return to the home field. As we passed over the Port Orchard airstrip I thought that a touch-and-go there would round out the evening's activities. My friend Jack made the approach, lined up with the dirt runway, and I made the "touch." Leaving Port Orchard, we bee-lined for home, levelling out at 1,500 feet.

Just about midway between the airports over extremely rough country, the engine sputtered and quit. I hit the throttle, thinking that it has been accidentally closed, but the engine refused to come to life. The obvious answer that we were out of gas dawned upon me.

After a frantic search for a place to land, where there was none, we spotted what looked like a garden plot alongside a lake. I had considered the lake, but it looked deep. Just then my passenger yelled, "Take this one!" and I headed for the garden.

The approach was made through a long shallow canyon, with our target at the end of it. As we drew closer to our objective, with timbered slopes of the canyon looming above us, I saw what appeared to be a small orchard and lined up with it.

After cutting a swath through the last two or three rows of trees, we were finally stopped by a high wire fence. The plane hit fully stalled and there was no shock, the right wing absorbing the impact against the gate.

Survey of damage showed a demolished right wing and broken landing gear. The next 15 minutes were spent convincing the elderly owner of the garden that we did not land deliberately in his backyard.

This taught me a lesson never to take anybody's word for it but carefully check every item before take-off.

NORMAN H. STENSAGER
Minneapolis, Minn.

BACK SLIDING

ONE WINTER morning at Otis AFB, Cape Cod, Mass., the weather station briefed me that a 200-knot jet stream was present at 25,000 feet over the field.

My radar operator and I boarded our Lockheed F-94C all-weather jet interceptor, climbed to 25,000 feet and, upon leveling out, pointed its nose directly into the horizontal "stream" 25 nautical miles south of the base.

One hour later we were 25 miles north of Otis while constantly holding a southerly heading at an indicated air speed of 150 knots. This resulted in a ground speed of 50 knots to the negative.

LT. JOHN WILLIAM BRILL
Purdue University
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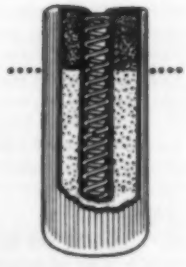

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HAVE YOU READ?

BY JAMES F. SUNDERMAN

THE AIR FORCE BLUE BOOK, edited by Tom Compere and William P. Vogel Jr. (Military Publishing Institute, paperback $1, hardcover $4.95).

Here is a magnificent publishing concept that ranks tops in the military reference-guide class, a miniature fact-packed narrative-statistical encyclopedia of the USAF.

The Blue Book combines attractive features for the layman, the professional airman and the businessman concerned with AF matters.

Articles by top current writers like Alsop, Michener and Bishop on airpower, space and related topics intermingle with hard-hitting factual staff-prepared essays on the AF mission, organization, operations, personnel, equipment.

Biographical sketches of air and space pioneers, a chronology of AF history, articles on aircraft industry and space conquest indicate the breadth of treatment. Numerous illustrations and more than 100 pages of chart and statistical data on AF history and current status add to the completeness of this handy directory.

Similar volumes, planned for other Services, now are underway. Annual production of Blue Books for all the Services is the ultimate goal.

A SKY OF MY OWN, by Molly Bernheim (Rinehart, $3.95).

This is a pleasant, informal story of Molly Bernheim, flying grandmother, flight instructor, and 3,000-hour-pilot, and her personal 12-year log-book set to narrative. Details of her experiences learning to fly—a dream she held for half a lifetime—and of her years in the air after solo are lightly chronicled. The student pilot, the amateur aviator and those who someday "hope to learn" will find it of interest.

THE CHALLENGE OF THE SPACESHIP, by Arthur C. Clarke (Harper, $3.50).

Long before the current hardware of space conquest left the drawing boards, a small group of science writers probed the universe with logic and amazingly accurate speculation.

Dean among this group is Arthur Clarke, highly respected British-American author, whose score of books, both fiction and non fiction, have drawn praise from professional scientist and layman alike.

Here Clarke, in a series of articles, takes the reader on what is perhaps his most delightful journey into the actual and theoretical world of outer space. Leaving the technical details to the experts, he drives for the meaning and practical application of space in terms the non-specialist can understand and appreciate.

Within this framework he explores the impact of space conquest and space travel on the human race, describes a typical space vacation in a satellite hotel orbiting the earth, gives a Mars-eye view and interpretation of our planet, describes the problems and realities of interstellar flight.

An explanation of the Star of Bethlehem, a discourse of unidentified flying objects, a provocative study of mind, matter, electronic research and life after death, an analysis of mysterious radio waves from outerspace exemplify the variety of topical coverage and serve to broaden the reader's basic knowledge of our known universe.

Even the tongue-in-cheek science-fiction reader will find this one delightful.

THE SOVIET AIR AND ROCKET FORCES, edited by Asher Lee (Praeger, $7.50).

WAR AND THE SOVIET UNION, by Dr. Herbert Dinerstein (Praeger, $5.50).

The balance of world power, U. S. vis-a-vis Russia, lies in the air.

Because we cherish and practice freedom of the press, our air/missile capability is largely an open secret. Not so with Soviet Russia and for this reason many Americans assume an extremely dangerous "superiority complex."

Asher Lee, recognized British authority on Soviet military matters, now offers a current look at Russian military and civilian air might through a distinguished collection of essays, each written by an expert American, British, German or Russian authority.

The book touches all facets of Soviet airpower: the historical beginnings and accomplishments in two wars; the doctrinal development; force structure and employment; current status and future projection. It compares personnel, management, operations, equipment (aircraft and missiles) with U. S. counterparts.

A complementary volume, *War and the Soviet Union*, probes the evolution of Soviet military thought and doctrine within the last decade. Originally prepared as a *Rand Corporation* Study for the Air Force, it treats the strategic views held by top Soviet military and political leaders today with accuracy and thoroughness.

These distinguished works demand careful reading by our civil-military policy makers and Americans in all walks.

(ADVERTISEMENT)

Max Conrad—poet, pilot and A & E mechanic—receives congratulations from Herb Fisher, tells Fisher how he built six big gas tanks (460 gals.) into this roomy Piper cabin, then sat on one for three days with scarce elbow-room to fly.

Battlecry—"Let's Fly!"

"... sicker'n a dog—
oh boy!
was that a long night!"

A behind-scenes report on Max Conrad's historic conquest of an ocean and continent—a World Record distance flight in a Piper Comanche specially equipped with new Foul-Resistant Champion Spark Plugs . . .

by Herb Fisher

international aviation authority, veteran test pilot, author

At 2:47 p.m. on June 4—58 hrs.-38 min. after takeoff from Casablanca, Morocco—a 56-year-old grandfather, so parched from thirst he could scarcely speak, landed a Piper Comanche at Los Angeles Airport. Max Conrad had set a new light-aircraft World Distance Record—7,668 miles. Light aircraft or heavy, the only longer flights officially on record are those of a multi-engine Navy bomber—11,236 miles, Australia to Ohio, crew of four—and a KC-135 jet tanker, 10,233 miles, Tokyo to the Azores. Conrad exceeded Pat Boling's recent light plane World Record by 812 miles.

As this shy, Lincolnesque "flying granddaddy" hit the headlines worldwide, his answers to countless variations of "How'd you do it?" invariably boiled down to this: "Oh, pretty much routine—just sat and flew, that's about all . . . " Max Conrad, alone, really knows what he went through during this lonely conquest of an ocean and continent. In some ways, it was an incredible flight, with conditions most grueling at times; for sure, it was a real "torture-test" of man and machinery.

This is the behind-scenes report on that flight:

Tricky Takeoff

Casablanca, June 1. With 520 gallons of B-P 100/130-octane petrol aboard, the Comanche grossed at 5,000 lbs.—*its gross load nearly three and a half times its empty weight.* Arabs and French stood hushed in the Moroccan dawn as the overloaded craft hurtled down the Cazes Airport runway, braked, taxied back, repeated acceleration tests again and again. Max Conrad found he could accelerate

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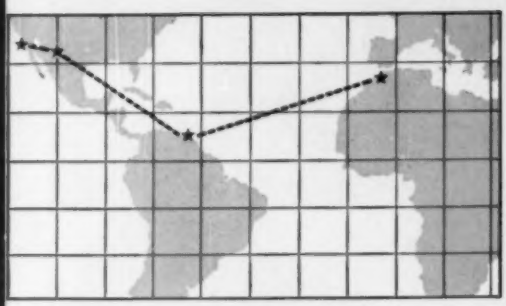
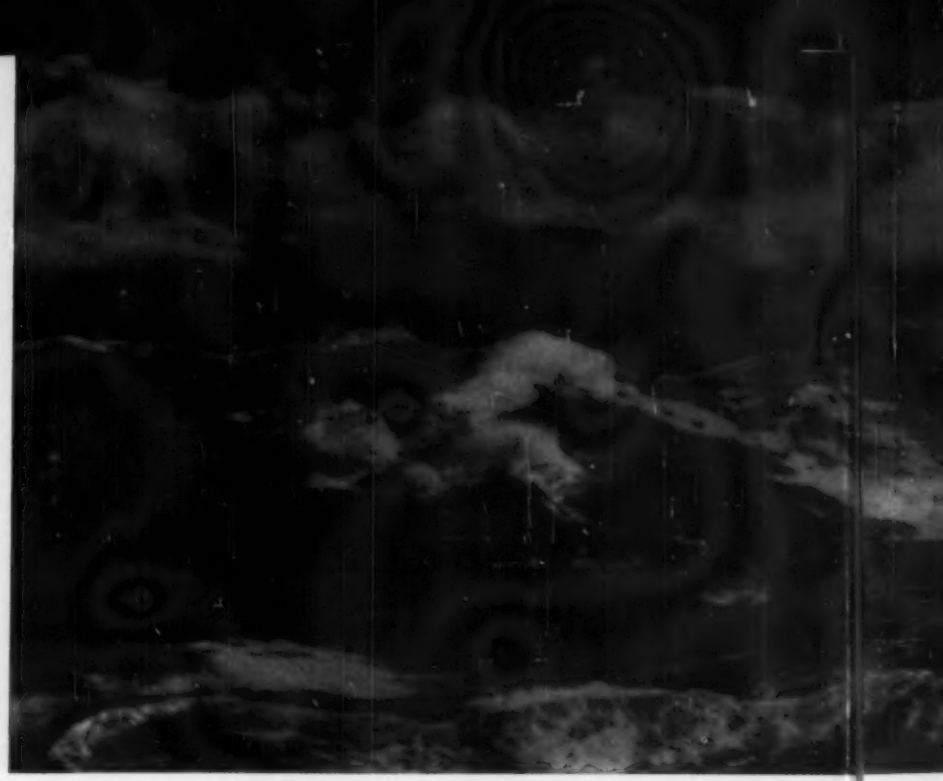


A classic in light-plane achievement: Nonstop, Casablanca to Los Angeles—on a single engine!



to 65 mph. in 900 feet, to 90 mph. in 1,600. He'd inflated tires to 50 lbs., twice normal pressure. He'd pumped up main landing-gear struts. He'd replaced a big generator with a small one; he'd removed starter, cowling latches, handles, door and window trim—all possible weight and drag items from an otherwise standard production-line Piper, selected at random from final assembly in February. Only "extra equipment" besides special radio gear and cabin fuel tanks was an inflatable life raft and a Mae West. He carried 13 quarts of oil—only one quart extra—trusting the 250-hp. Lycoming's reputation for low oil consumption. A new kind of spark plug had been rushed to him by Champion—plugs said to resist fouling-deposit build-up on prolonged flight.

Conrad was all set . . .

June 2, 11:09 a.m. Unfavorable direct crosswind of 8 knots. Unfavorable 6,000-ft. runway with no over-run. He'd have to lift off northeastly, directly over Casablanca . . .

Conrad waved, yelled the slogan made familiar during a life-long crusade to get youth air-minded: "*Let's fly!*"

He "ran scared" down the runway—"these 10 seconds, I'll admit, were full of grave misgivings . . . squeezed into my little cubby-hole, sitting on one gas tank and surrounded by the others I'd built into the cabin, I felt I'd painted myself into a corner and now it was just too late to get out . . ."

At 110 mph. and 4,000 feet down the strip, the plane lifted gently—"I was just plain surprised at how easy it did get off—and boy! those climb-out moments were the happiest and most relieved ones in my life!" The Comanche climbed out over Casablanca at 500 feet per minute —*despite the payload of more than double its own weight.*

Throat dry, Conrad pointed his plane at the Atlantic and reached for the water jug. No water! He'd forgotten it—while remembering everything else. He had only a thermos of coffee and tea . . . no food . . . and one great ocean and one great continent ahead . . .

The "Big Lonesome"

The 3,700-mile Casablanca-Trinidad leg is one of the longest, loneliest stretches in the world, unfrequented by airliners, ships or weather boats. Little weather data is available; navigation aids are nil. Conrad flew dead-reckoning with a standard Piper compass . . . bucking headwinds the first hundred miles, then entering the first of a series of buffeting rain squalls.

Rain and extremely rough air were to plague him throughout his entire 6,000 miles over open seas—though he varied his altitude, in frustration, between 100 and 2,500 feet . . .

Fore and aft of "no-return"—beyond African radio reach and too far out to pick up South America—time was a turtle on an endless racecourse: "You just never know that inner grip of real loneliness—aloneness—until you're stuck there alone with all the vast forces of nature—endless black skies and a mighty empty ocean—and cut off from everybody and everything in the world. It's a funny feeling, like a 'break-off' from the world might be . . . and here I'd had 55 solo ocean-crossings under my belt! . . ."

Conrad picked a wicked rain squall and purposely plunged into it. He held his thermos cup out the window. The torrent swooshed out as fast as it came in. He got nary a drop. "Exasperated, I removed the funnel-shaped antenna-lowering tube and held it out. I got barely enough to wet my lips." Despairfully, he programmed his tea and coffee for one sip per hour . . .

Reconciled to rough air, Conrad relaxed. Drowsiness set in. Drowsiness that was to nag him with increasing frequency as the trip progressed through its second and third day . . .

"To navigate under these conditions, you've got to stay more than awake—*alert!* On Piper AutoControl, it's easy to let the plane fly itself. Squished in with the six big gas tanks, I couldn't move around much to perk myself up. So I staved off drowsiness by straining forward in the seat till it hurt, then sitting back again and forcing myself to think through every step of something I wanted to build—or planning the next steps in my campaign to give children more opportunities in aviation . . ."

Conrad crossed Trinidad at tree-top level—so the Federation Aeronautique Internationale, world governing body

". . . an inner grip of real loneliness, cut off from everybody and everything in the world . . ." Max Conrad, in describing his historic conquest of an ocean and continent for the World Distance Record, June 4, 1959.

for World Record attempts, could officially recognize his plane—at 26 hrs.-39 min. from Casablanca. Average speed so far, 140.8 mph.

Showdown

After Jamaica, night closed in again. And all hell broke loose: Severe thunderstorms raked the entire Gulf of Mexico, blacking out communications and navigation with ADF and putting the overloaded Comanche through a real stress wringer. Pilot? "Well, my minted Arab tea had become rancid, so I was just sicker'n a dog—oh, boy! was that a long night!"

It was a night of illness compounded by "many black hours of doubt." A night of listening hyper-sensitively to the plugs firing that 250-hp. Lycoming as it pulled the heavily burdened Comanche. A night of being alone as he'd never been before . . . Sure, Champion had been firm, unequivocal: "Those plugs are specially designed to resist ordinary fouling-deposit build-up from taxi through prolonged flight, regardless of operational extremes, and to give you smooth full-power all the way . . . it's a major engineering advance, with a new firing-end providing self-cleaning action by combustion gases . . . they're already tested, approved and available for Lycomings and Continentals—" Well, be that as it may, the plugs were "experimental" to him, they'd never had a workout on a flight like this . . . and nobody'd ever flown as far as he aimed to fly . . .

For six hours Conrad was unable to establish communications or get a station bearing. Fearing drift into the mountain barrier of Yucatan if he kept his compass heading, he veered northward—then, flew aimlessly for 500 miles, "just stooging around the Gulf," awaiting daylight and abatement of the violent electrical storms . . .

At 5:33 a.m., Conrad hit the sunny skies of Corpus Christi. Four hours over ETA. (The 500 miles of "Gulf-stooging," if included in his non-stop distance record, would make 8,300 actual miles flown!)

From Corpus on, it was a grueling endurance run, "hugging the desert and keeping an eye and ear on that engine!"

A hero's welcome was set for Conrad at El Paso, original destination. But he'd been figuring: Since Casablanca, he'd gradually reduced power from 131 to 100 mph.-indicated, to extend range, and hadn't touched his two 30-gallon wing tanks yet. Also, despite constant low-power flying and the other adverse operating conditions, the Lycoming engine "was still purring like a kitten, though I was just certain those plugs must be heavy with fouling deposits by now." Scarcely able to speak through parched lips, Conrad radioed: "I'm going to try to make Los Angeles—but

A long and lonely vigil for family, too . . . then—the happy ending!

". . . farther'n any light plane had ever flown, yet the fouling-deposit build-up I expected just wasn't there! It's a remarkable bit of spark plug engineering you people really ought to holler about . . ." Conrad, center, reporting to R. K. Christie (L), Champion Vice-President, Research & Engineering, and R. L. (Doc) Anderson, Aviation Service Manager, on torture-test of new *Foul-Resistant* plug.

I'd sure trade a gallon of gas for a glass of that El Paso water right now!"

With a bevy of airborne newsmen and photographers in tow, Conrad climbed from 100 to 10,000 feet and aimed for the Pacific.

City of Angels

The afternoon of the third day, Max Conrad set down, near mute with thirst and fatigue . . . into the pads, pencils, microphones and cameras of newsmen . . . grabbing a glass of water . . . then, into a phone booth to talk to a daughter in San Francisco . . . then, an hour after landing!—taking off for Santa Ana, a motel bed and a midnight walk "to rest up before sleeping."

"Could have gone another 500 miles," Max told me later. "I had 30 gallons left in my wing tanks. Fuel consumption for the whole trip averaged 8.02 gallons an hour. Speed, 131.1 mph. And oil, just seven quarts! But one of the things I was most curious about, Herb, was this new plug they're calling *foul-resistant:* Well, the mechanic and I pulled the plugs at Santa Ana and took a hard look at those two-prong electrodes, bigger bores and longer core noses.

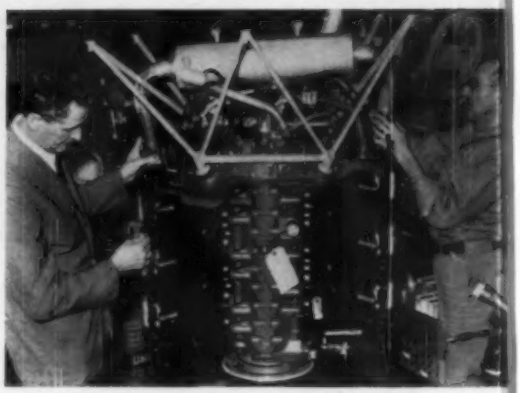
"Herb, the build-up of lead and carbon that I expected *just wasn't there.*

"That different kind of firing-end really let those combustion gases blast 'em clean! After a flight like that—Paris, Casablanca, taxiing, then pulling this load through the bumps to L.A., farther'n any light plane'd flown—it's really a remarkable bit of spark plug engineering that Champion ought to holler about!

"I've had to turn back on flights—a try for records, too—because of trouble.

"But, Herb, I've never made a distance flight like this where *everything* worked so one hundred per cent perfect *all* the time!

"That engine never missed a beat . . ."



Conrad (L) picks a standard 250-hp. Lycoming off assembly line. Fired by a new type of Champion plug, it powered his production-line Piper Comanche to a World Record. The new plugs are now available in RHM 38E, RHM 40E, REM 38E and REM 40E designs for Lycoming and Continental engines.

Reporters press forward so they won't miss a word as Conrad bolts into phone booth, moments after touch-down, and talks to a daughter in San Francisco.

WHO IS MAX CONRAD?

Flyin' Granddaddy—10 children, 7 to 27; two grandchildren . . . 36,000 flight hours; A & E mechanic.

Songwriter—Has composed music fervently for years, mostly while soloing ocean; several love ballads recorded. "Flyer's Rosary" means most to him; "Hills of Sicily" he thinks best. Says "I'd rather write one song that'd last than hold 50 flight records."

Aviator—Paradoxically, studied music, mechanical engineering in college. With orchestra, attended first Ford Air Show, 1926, Detroit; inspired to try to create "flying orchestra." Took flying lessons, quit with 3 solo hrs., bought plane, barnstormed country, instructed. "First student soloed when I had but 38 hours." Owned 2-plane "airline" in '29. Next, charter outfit, flying "personally conducted" sightseeing tours to Calif. War II, headed 6 aviation schools. Next, Northwest Airways, bush-flying Alaska, Canada. Then, 9 years Minneapolis-Honeywell pilot. Now, veteran ferry pilot.

Habitual Lindbergh—First crossed ocean in '48 (Christmas) to visit family in Switzerland: "Too leary of airliners, so, took the Queen Mary!" Made first ocean flight two years later—solo; a Piper Pacer. Now has 56 ocean-crossings, more scheduled . . .

Youth Crusader—Established "airport workshop" for kids in hometown, Winona, Minn. "Grubstaked" promising ones with own time and money. (Most repaid him years later.) *Winona reportedly has produced more airline pilots per capita than any other U.S. city!* — "because kids had a *chance*." At Congressional hearing in '52, Max interested Congress in nationwide "Winona Experiment," explaining how he'd started Minnesota's with Tri-pacer parts he'd bought for kids to assemble, advocating cities establish Youth Centers with recreational and "aviation workshop" facilities at municipal airports. —FISHER

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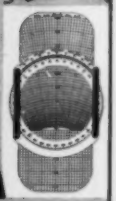

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FLYING CALENDAR

Sept. 23, 24—The 1959 Airwork Operations Symposium at Millville, N. J., conducted by The Airwork Corp.

Sept. 30-Oct. 2—13th annual meeting of the Southeastern Airport Managers' Association at the Washington Duke Hotel, Durham, N. C.

Sept. 30-Oct. 3—Twenty-third annual Convention of the International Northwest Aviation Council at Multanomah Hotel, Portland, Ore.

Oct. 3, 4—Fourth Michigan SMALL RACE from Bay City, Mich., to Benton Harbor, Mich., sponsored by the Michigan Ch. of Ninety-Nines, Inc. Write Elsie E. Ferich, 3106 Yale St., Flint 3, Mich., for details.

Oct. 3, 4—West Coast Aircraft Show at San Luis Obispo, Calif., to promote and encourage flying. Admission free. There will also be a barbecue and square dance on Saturday night, Oct. 3.

Oct. 3-10—Eleventh annual All Texas Air Tour. 36 stops, 3,000 miles of Texas hospitality. Sponsored by Tex. Private Flyers Ass'n., Tex. State Aviation Ass'n., Tex. 99's, Tex. Flying Farmers, Tex. Wing CAP. For information: Contact, Texas Air Tours, 307 Walton Bldg., Austin, Tex.

Oct. 5-7—Institute of Aeronautical Sciences, 7th Anglo-American aeronautical conference, technical sessions, Hotel Astor, New York City, N. Y.

Oct. 6—Fly-in barbecue to celebrate opening of Howard County Airport. All-Texas Air Tour, USAF and Webb Air Base will assist with fly-overs, static displays, demonstrations, etc. Write: Ch. of Comm., Box 1391, Big Spring, Tex.

Oct. 6-9—National Airports Conference at the Univ. of Okla., Norman, Okla., co-sponsored by the Am. Assoc. of Airport Executives, and the U. of Okla., with active cooperation of the FAA.

Oct. 6-8—12th NBAA Meet, Hotel Leamington, Minneapolis, Minn.

Oct. 7-10—Air Traffic Control Ass'n. 4th annual meeting, Oklahoma Biltmore Hotel, Oklahoma City, Okla.

Oct. 8—Society of Experimental Test Pilots, symposium on "Pilot's Role in Space Exploration" Beverly Hilton Hotel, Beverly Hills, Calif.

Oct. 10-12—Columbus Day Soaring Meet, Wurtsboro Airport, Wurtsboro, N. Y., sponsored by Metropolitan Airhoppers Soaring Ass'n. Contact: Alex Dawydoff, 30-21 48th St., Long Island City, N. Y.

Oct. 12-13—Annual meeting of National Assoc. of State Aviation Officials at Mark Hopkins Hotel, San Francisco, Calif.

Oct. 12-16—1959 National Aeronautics and Space Administration Inspection at Langley Research Center, Va.

Oct. 12-16—15th General Convention of International Air Transport Ass'n., Tokyo, Japan.

Oct. 17-19—Florida Aero Club Weekend flight to Nassau, B. W. I. Stay at British Colonial Hotel. $49.50 for complete package. Contact: Harry B. Collins, Air Cruise Dir., 375 N. E. 154th St., N. Miami Beach 62, Fla.

Oct. 17-25—Outer Space Show at 107th Regiment Armory, Park Ave. and 66th St., under auspices of Society for the Advancement of Astronautics.

Oct. 19-Nov. 14—Fourth annual Midwest Agricultural Pilot Training course at South Dakota State College. For information write: Ralph Lindsay, air coordinator at S. D. State College, Brookings, S. D.

Oct. 19-25—Annual Plantation Party of AOPA at Galt Ocean Mile Hotel, Fort Lauderdale, Fla.

Oct. 20-22—12th Annual Indiana Aviation Conference, Turkey Run State Park, Marshall, Ind.

Oct. 25-28—Legal Eagles (Flying Lawyers) organization Fly-in, Sullivan County Airport, Monticello, N. Y. Meetings and accommodations at Hotel Concord, Kiamesha Lake, Monticello, N. Y. For information, write Albert Rathblott, Esq., P. O. Box 289, Camden 1, N. J.

Oct. 29-Nov. 16—Caribbean Island Hop, H. B. Collins, 375 N. E. 154 St., N. Miami 62, Fla.

Oct. 31—Second annual national Aero Club Football Fly-in, Ann Arbor, Mich. Wisconsin vs. Michigan. Write: NAC, 2311 Shelby, Ann Arbor, Mich.

Nov. 2-4—Annual midwestern meeting of The Institute of Aeronautical Sciences at the Lassen Hotel, Wichita, Kan.

Nov. 11—Fly-in Breakfast, Fairview, Okla.

Nov. 16-20—NATA 20th Annual Convention, Hotel Monteleone, New Orleans, La.

Dec. 26-30—Sixth King Orange International Model Plane Meet at Miami, Fla. under primary sponsorship of the Air Training Corps. Over $5,000 in scholarships, trophies and prizes to be awarded. Write: Tom Sutor, Ch., Air Training Corps Flying Club, 5313 Granada Blvd., Coral Gables 46, Fla.

Calendar items must be received at FLYING's editorial offices, 1 Park Avenue, New York 16, N. Y., three months prior to the event.

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This transmitter is recommended for use with ARC's line of tunable receivers, (R-13B and R-19) for a primary communication system on small aircraft or as a "back-up" to ARC Type 210 Transmitter-Receiver on larger aircraft.

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AT NATIONAL AIRPORT—WASHINGTON, D. C., the staff of Paul Butler (inset left) provides fast, efficient and dependable Butler-Shell Service on a 24-hour, 365-day schedule.

Butler Service-for

Paul Butler, President of Butler Aviation, has an outstanding success record as a Shell Dealer. His operation now takes in 6 important American airports. This is due to an unbeatable "success" combination—highest quality products and equipment, *plus* those service extras that make and keep friends in the aviation business.

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The Butler clientele reads like a WHO's WHO in aviation . . . with special emphasis on corporate aircraft. All of his customers quickly learn that the same fast, efficient, on-schedule Butler Service is the motto at all 6 bases. They can handle anything that flies . . . from pistons to jets!

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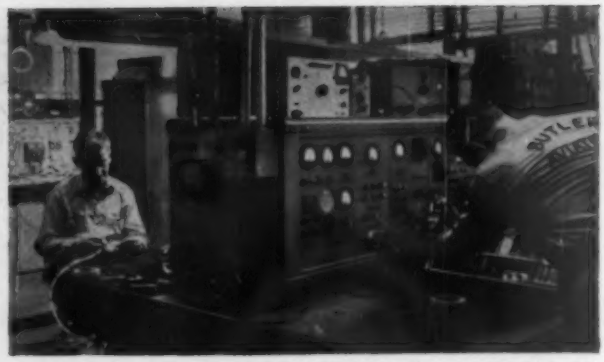
AT GREATER ROCKFORD AIRPORT—ILLINOIS, as throughout the Butler organization, the complete line of AeroShell fuels, fluids, greases and lubricants—including new AeroShell® Oil W—is stocked.



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AT GENERAL MITCHELL FIELD—MILWAUKEE, WISC., newest base in the expanding Butler chain.

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—and your nearest Shell Office will tell you why.

SHELL

The Fable of Horatio and His Father

GILL ROBB WILSON
Publisher

ONCE upon a time there was a businessman. He was very rich and important and he lived in a big white house on top of the hill with his beautiful wife and children. Down in the valley, where he could look at it from his front porch, was the factory that made merchandise with the businessman's name on it. It was the best merchandise of its kind in the world. Everybody who lived in the valley said so.

The businessman was very proud and happy. He would handle the fine things his factory produced with loving care, almost as though they were alive. He would stop to talk with the row of bookkeepers who sat on the high stools and made entries in the company ledgers. How neat and accurate they were and how swiftly they could work with figures!

Also he loved to talk with the "drummers," the salesmen, when they came in off the road with their order books full of orders.

Above all the businessman loved the annual company picnics when he could talk to all his employees together. He wanted them to be straight thinkers like himself. He would recite business proverbs to them:

"A bird in the hand is worth two in the bush."

"Fools rush in where angels fear to tread."

Then Satan began to creep into Paradise. Price cutting competition entered the valley. Competitors blanketed the market with servicemen. The order books were no longer full. The bookkeepers were furloughed one after another.

Eventually the businessman gathered his family and a handful of his oldest friends and employees around him. He announced that the business would be sold before the family fortune was all dissipated.

But before he had finished the announcement, his oldest boy, Horatio, asked if he could have the floor for a few remarks. Horatio had been in the Air Force and had a lot of medals and stick time in fighters, but the old man didn't think he could be a top hand with a balance sheet. And in truth the old man was right. Horatio didn't know a balance sheet from a weight and balance formula for loading a DC-3.

However, he did know a few other significant things. He knew the old man's technicians were the best of their kind. He knew the company had an unimpeachable reputation for integrity. He knew the family name stood for quality.

Now he proposed that instead of surrendering—an ugly word to a fighter pilot—the old man make him Sales Manager, borrow some working capital, devote himself to product improvement and as he said, "watch my smoke."

The old man's heart swelled with pride. The tears ran down the cheeks of Horatio's beautiful mother. Neither the old man nor his wife figured Horatio had what it took businesswise, but the boy had guts . . . he didn't want to save his share of the inheritance . . . he wanted a fighting chance to put the company back at the head of the parade. Maybe he had something in addition to guts!

One day a few years later when the value of the company had quadrupled in price on the New York Stock Exchange—and even then was selling at only seven times earnings—the Chairman of the Board (i.e., the old man) was overheard telling a crony at the Union League Club:

"Yes sir, I thought Horatio was a complete lunatic when he installed that IBM system and tied everything into it—inspection, quality control, field service, cost analysis. I became a little more certain he was crazy when he arranged direct teletype to cities where we had never sold a dollar's worth of goods; and leased special wires to wholesalers. Then when he bought an executive airplane for me, and a half dozen light twin-engine planes for our sales force, I knew the end of the world, (my world at least) must be at hand. I asked, 'Horatio, what in the world is this all about?'

"He said, 'Pop, it's not complicated. It's simple. I learned it when I was flying fighters for SAC. First you got to have the gadgets that can get you to the target. After a little practice, you begin to see how you can hit bigger and better targets. The gadgets challenge you to live up to the things they enable you to do.

" 'Now, you'll notice, Pop, that not a single gadget I've installed is a quick buck thing. Everything is an ambition-stretcher, an eye-opener, a horizon-broadener. Not the market in the valley, but the market that can be reached by long-legged telephones and airplanes and radio channels is our market. We can make sales stick as far as we sell and service.

" 'The irresistible law of our world, Pop, is grow or grovel.'

"You know," the Chairman of the Board continued, "I used to have a lot of proverbs I was fond of, but there's only one of them that I still quote with assurance."

"What's that?" asked his crony.

"I got it from riding around in my airplane," mused the Chairman of the Board. "I got it from the viewpoint of looking down on big areas, of covering lots of leagues, of doing many things."

"Well, what is it?" insisted his friend.

"As a man thinketh in his heart, so is he," said the Chairman of the Board. "A business with wings for its mind isn't going to perish in a valley."

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AMERICAN AIRLINES—THE JET AIRLINE

BUSINESS FLYING OUTLOOK:

STEADY RECORD-BREAKING GROWTH THROUGH THE EARLY '60s

Industry and government leaders say business and general aviation are on the threshold of a new decade of progress, but there are major problems ahead.

By FRANKLIN D. WALKER

IT HAS BECOME almost standard practice, in reviewing business flying's past and forecasting its future, to handle the story of this developing giant of civil aviation with glowing adjectives and sparkling superlatives.

Most certainly, what has happened since 1946 in the use of aircraft by business and industry is without parallel and the total accomplishment must be termed spectacular, tremendous, etc.

However, to the reporter assigned the task of assessing business flying progress, ferreting out trends and portents, examining problems and taking a peek ahead, an entirely new set of adjectives and superlatives is going to be needed for this chore in the years to come because business flying is on the threshold of a new decade of progress that will surpass any accomplishment yet recorded in its meteoric expansion to the forefront in air transportation.

This you-haven't-seen-anything-yet prediction is based on a study of business flying's record in the past ten years, on discussions with key industry and government leaders and on a look at the economic indicators and the way they are pointing.

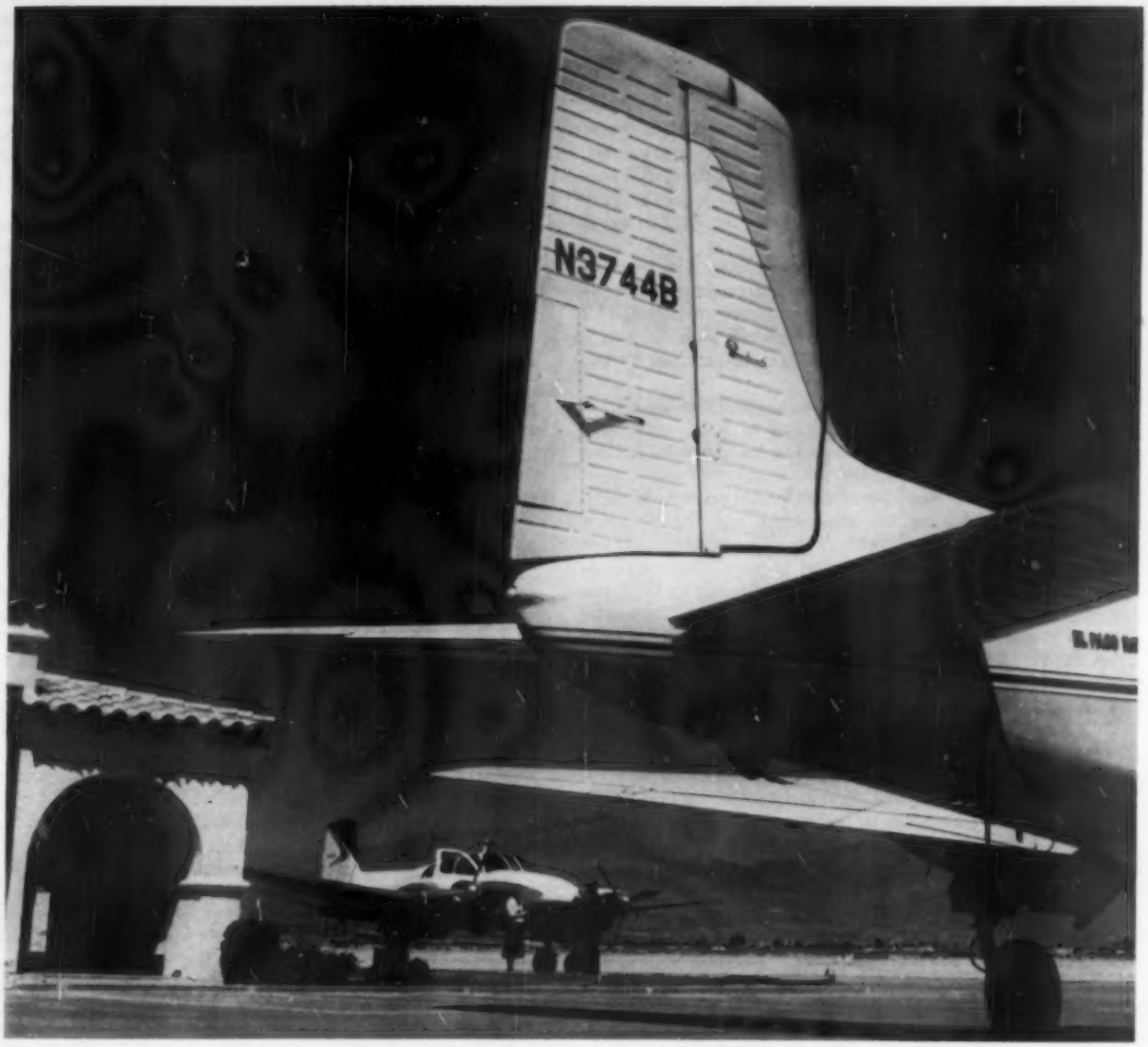
Continuing the vigorous growth pattern begun in 1946, business flying in 1959 will exceed substantially the totals of 1958, which chalked up impressive new advances in all areas of its operations. Its vast fleet of single and multi-engine aircraft flew 5.3 million hours and more than 787 million miles—both new records—on a multitude of missions to large and small airports throughout the country.

In addition to flying more than 65,000 single and multi-engine aircraft, general aviation also includes many helicopters. The Helicopter Council of AIA lists 85 companies throughout the country as owners and operators of helicopters used daily for a wide variety of special short-haul jobs, and reports that the number is increasing steadily.

These figures are, of course, part of a very familiar pattern. A study of statistics dating back to the first peacetime year following the second world war reveals that business has long been settled firmly in a pattern of steady, solid growth unmarred by violent fluctuations.

It is the type of growth that promises to continue indefinitely into the distant future, barring a disruption in the nation's economic expansion, and there is general agreement that even such an event probably would mean only a temporary setback in business flying's progress.

The airplane has proved itself as an essential tool in



business communications and it is so widely used that it cannot be easily discarded, even in periods of retrenchment for economic reasons.

Business flying's momentum, clearly demonstrated in tabulations of hours and miles flown from 1946 through 1958, would be sufficient to carry it to new heights in the first few years of the next decade. However, additional impetus is provided by the rising tempo of competition in business and by the continuous strengthening of the nation's economy. Experts forecast periods of adjustment ahead to consolidate gains, but no serious recession in the foreseeable future.

A glance at tabulations of hours and miles flown by business aircraft—statistics used most often to point up the spectacular nature of its growth—disclosed the pounding vigor of this booming area of aviation.

Yearly figures on business flying hours march down the column: 2.7 million in 1950; 2.9 million, 1951; 3.1 million, 1952; 3.6 million, 1953; 3.8 million, 1954; 4.3 million, 1955; 5.3 million, 1958.

The same strength emanates from the column tracing business aviation's miles flown history: 339 million, in 1950; 379 million, in 1951; 499 million, in 1953; 552 million, 1954; 672 million, 1956; 720 million, 1957; 787 million, 1958.

What once was considered spectacular, tremendous, amazing has become routine. The figures say that business flying has now entered an era of stability and orderly growth, and that its dominant position in the nation's airspace and the nation's economy will be strengthened with each passing year.

The transformation in business flying growth from the gee-whiz spectacular to the steady, long-haul pace is shown in still another set of figures. Of total hours flown by general aviation (all civil flying excepting airlines) in the period 1946 to 1953, business flying's share climbed to 42 per cent. In the same period, business flying's portion of miles flown by general aviation went up to 48 per cent. In a word, spectacular.

In the past six years, hours and miles flown reveal a different and perhaps more gratifying pattern. Steady climbs in big gobs are still reflected in total hours and miles flown, but while business has the lion's shares they are not being recorded in large annual percentage jumps.

While business aviation's share of total general aviation hours in the air advance from 3.6 million in 1953 to 5.3 million per cent in 1958, its percentage rise was only 3

per cent. The picture is about the same in the area of miles flown. Business recorded 499 million miles in 1953 and 787 million miles in 1958 but, against general aviation's grand total, the percentage increase advanced only three points.

What these figures point up is the excellent health of all segments of general aviation, as well as that of business flying. The pattern of steady, rather than spectacular, growth is as noticeable in one area as in another. All segments of general aviation are growing and together they represent non-scheduled civil aviation at its strongest point of development in many years.

General aviation—including business, pleasure, instructional, contract, charter, industrial and commercial agricultural flying—rolled up the impressive total of 11.7 million hours in the air in 1958 and swung into 1959 with confidence that 12 million hours would be reached by the end of the year.

In calendar 1958, general aviation topped the 1.5 billion mark in total miles flown, according to FAA estimates, and the year-end figure is expected to be about 1.7 billion miles.

Gains in other areas of general aviation, such as aircraft for hire, for agriculture, for instruction and for pleasure, also were substantial last year. Two very bright spots appeared in the grass roots aviation picture. Instructional flying accounted for 2 million hours in the air in 1958, the highest mark since 1950, and topped the 200-million-mile figure for the second time in eight years. However, the FAA reported that student pilot licenses issued last year dropped to 58,107 from the 1957 high of 76,850.

The number of flying hours reported by pleasure flying climbed a bit higher above the 2 million level, where it has been for three years, and hung up its best air mileage (263 million) in ten years.

It is customary in presenting figures on miles and hours flown by general aviation to point out that, in each category, the totals were substantially higher than those recorded by all domestic scheduled airlines combined. It was true again in 1958 and it will be true year after year. Business flying alone flew 1.8 million hours more than the total revenue hours of all domestic airlines last year.

General aviation's rate of growth is running well ahead of the rate set by even the best informed, most expert forecasters. For example, the CAA (predecessor of FAA) in 1956 predicted that general aviation would fly 11.8 million hours by 1960. That mark was reached last year, two years ahead of schedule, invalidating forecasts for 1965 and 1970 but underscoring the actual rate of growth in general aviation.

In addition to the encouraging picture of business flying and general aviation as reflected in figures and in the expanding economy of which they are an essential part, the tone of industry and government comment is one of firm confidence in the future.

The Aerospace Industries Association reported that the dollar value of utility and executive aircraft of all types shipped to customers by manufacturers in 1958 reached $101 million, second highest in 12 years. The total number of aircraft shipped was 6,414. In the first six months of 1959, a total of 4,067 shipments valued at $67,956,000 was reported.

The consolidation of all federal aviation activities (excepting the CAB) under the single authority of the Federal Aviation Agency augurs well for general aviation, although there are some reservations about full endorsement of the new agency until its operations are thoroughly shaken down.

One of the most encouraging developments was establishment within FAA of a Business Operations Branch to devote its entire time and resources to the welfare and problems of business flying throughout the nation. The Bus Op branch is so new its skeleton staff cannot define exactly all of its areas of responsibility, but its important objective is the creation of a competent staff of general safety inspectors, or business flying specialists, and their assignment to key communities where business aircraft activity is heavy. They would be available for many types of assistance required by pilots and crews, but none of these services has yet been spelled out. Close liaison with all organizations concerned with business flying is, of course, a basic job of the new unit.

General aviation cannot, of course, depend upon any single agency of government to look out for its interests. If it is to maintain its position as the No. 1 user of aircraft and the No. 1 user of the airspace, general aviation must present a strong, single-purpose voice in discussions of proposed regulations or policies affecting its operations. Each element of general aviation has a big stake in maintaining non-commercial civil aviation unfettered by rules, policies and directives which might impede its freedom and growth.

The rosy future of business flying and the other elements of general aviation does not mean a world without problems. General aviation will carry many of its old, familiar problems into the busy decade ahead and it can anticipate many new ones.

As the largest single user of the airspace now and as far into the future as anyone can see, general aviation will continue to wage the good fight for its right to fly into any civil airport. The FAA recognizes that right but, in the words of one of its chief spokesmen, "the day of the unrestricted use of the airspace by any user has vanished."

With the number of IFR operations increasing daily and with an extremely high percentage of them in altitudes from surface to 15,000 feet, general aviation—particularly the multi-engine business operators—must place greater emphasis on maintenance of instrument and flying proficiency. It is in their own self-interest to do so. At the same time, industry must develop a simplified IFR system that pilots with a minimum of experience can follow and use.

Without an adequate airport system—adequate in numbers, in location, in facilities—the growth of general aviation could be seriously retarded. The development of new airports and the expansion of present airports must keep pace with the steady expansion in all of aviation, or the congestion already developing in many high density areas will bring about drastic restrictions on some elements of general aviation.

For the fiscal year 1960-1961, $63 million in federal airport aid will be made available to communities on a matching fund basis. The same amount has been earmarked for the following three fiscal periods. More than the administration asked for but less than the Congress recommended, the $63 million fund is only a tiny fraction of the amount—$1.2 billion—the National Airport Plan recommended as the amount needed to build an airport complex adequate to meet present needs of all airspace users. The difference between the two figures represents an intriguing compromise with reality, especially in view of the fact that many small airports are disappearing in the maw of suburban development and it is impossible to expand others for the same reason.

The loss of small airports, estimated to be about 400 each year, is a serious problem to general aviation as a whole but it is especially serious to those who fly for the sheer pleasure of doing so. The neighborhood strip, once lost, is seldom replaced.

Summing up, general aviation has completed a banner year and, led by booming business flying, is nearing the threshold of a decade of expansion and usefulness unmatched in aviation history. Its problems are many, but its impact on the nation's economy is inescapable. END

AIR LEADERS CITE BUSINESS FLYING PROGRESS

Special Statements for FLYING Magazine

JOSEPH B. BURNS,
President,
National Business Aircraft Association

'. . . Unlimited Potential of Business Aircraft.'

THE STEADY RISE in the number and hours of use of company-owned aircraft during the past year by American business is not a mere temporary expansion due to revitalized economic growth, but rather it is a vivid demonstration that our business leaders have found a new "tool" for management in the use of aircraft in business.

In the wide range and variety of business aircraft available to them, businessmen have found a triple threat means of communication which enables them to maintain a closer, more efficient and personal management control over their sources of raw material, their production centers and their sales areas.

This steady growth in use of business aircraft has resulted in a rise of 18 per cent in sales of light twin utility aircraft in the first half of 1959 compared to the same period in 1958. In dollar value aircraft sales in this field show a 22 per cent increase. Current deliveries are now being made of turboprop business aircraft, and within 18 months jet business aircraft are scheduled for delivery.

The helicopter is now being used by business in increasing numbers.

These dynamic advances will be further spurred by our traditional free enterprise system as more American businessmen become aware of the unlimited potential of the business aircraft. Truly, we have but scratched the surface in this swift and fascinating age of the air.

E. R. QUESADA,
Administrator,
Federal Aviation Agency

FAA's Business Flying Specialists

GENERAL AVATION is the fastest growing and the biggest user of the Federal Aviation Agency services. The entire aviation industry recognizes its contribution and importance, which have been very real and substantial indeed.

In 1958, general aviation accounted for 40 per cent of the load on our air-ground communications; 44 per cent of the traffic at airports where we maintain control towers, and 12 per cent of all instrument approaches. These operations are impressive.

The FAA is doing everything it can to further strengthen and encourage general aviation. We have established within FAA's Bureau of Flight Standards two new branches, the General Operations Branch and the Business Operations Branch. These will deal exclusively with general aviation matters. We have also assigned 13 general safety inspectors, all business flying specialists, to key district offices around the country for the convenience of general aviation aircraft owners. We intend to increase this group in the months ahead.

We are proud of the help given general aviation by the airport grant-in-aid program. Millions of dollars have been set aside for airports which serve only general aviation, in addition to those also served by the air carriers.

The FAA today faces many vital problems. All relate to the general welfare of the public, to its safety, national security and economy. We do all within our power to be reasonable and realistic in our relations with all users of the air space.

However, all groups, civil and military, must face the inevitable fact that they will sooner or later have to accept some restrictions or comply with some regulations they might not like. In this connection I want to repeat that we are not overlooking the rights and needs of general aviation. The FAA exists to serve all of aviation. It was created by law to provide for the safe and efficient use of the air space for all, and for the regulation and promotion of civil aviation in a way that would best foster its development and safety. The problems of general aviation occupy a most prominent place in our pursuit of this matter.

ORVAL R. COOK,
President,
Aerospace Industries Association

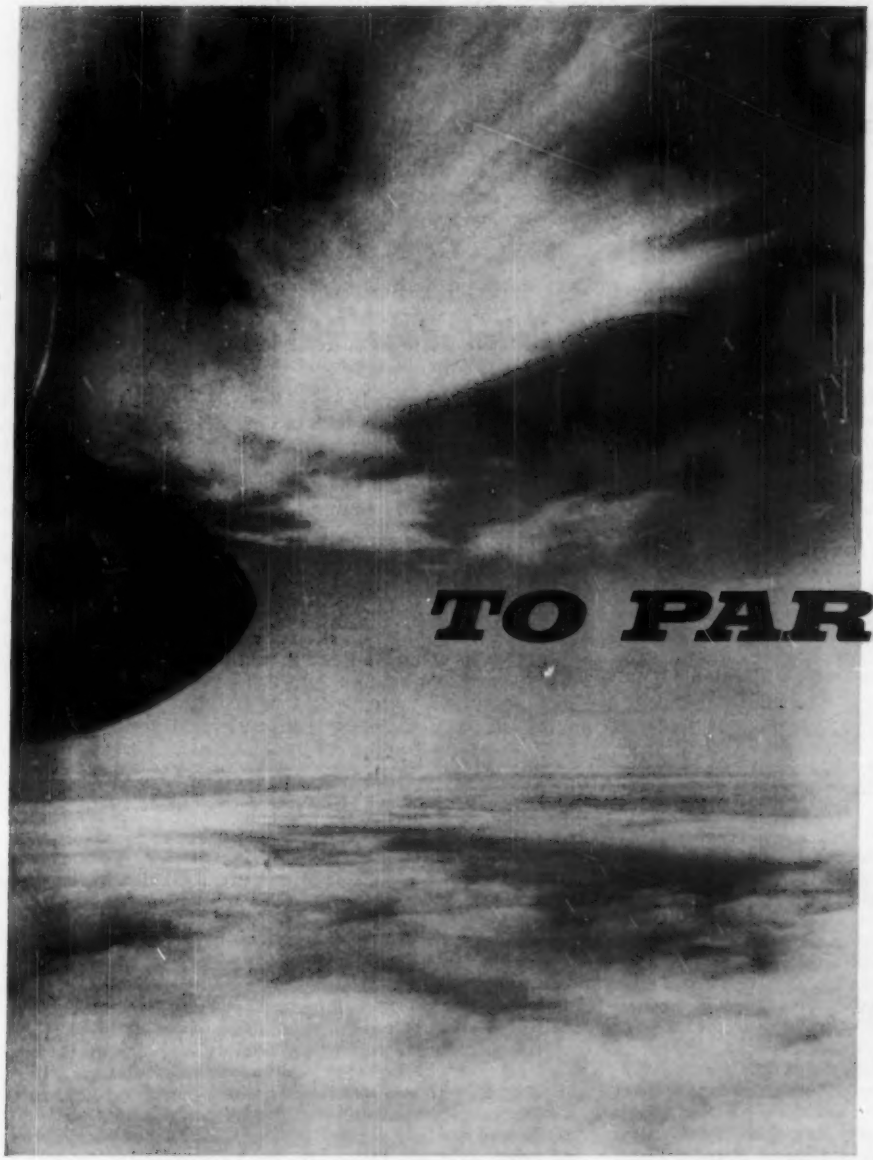
'. . . Growth Trend Is Dramatic.'

GENERAL AVIATION is the largest user of the nation's aviation facilities and operates an active fleet in excess of 65,000 aircraft, which are now flying at a rate of about 12,000,000 annual hours. The size of general aviation becomes more apparent when you realize it operates about 40 times as many aircraft, and flies three times as many annual hours as the nation's airlines.

It astonishes the average person to learn that the great volume of civil flying in this country is not by the airlines, but by business and professional men, and those engaged in agriculture, who have made the small aircraft an indispensable tool. Almost half of all non-airline flying is now directly for some business purpose, and the nation's business aircraft fleet includes several times as many multi-engined aircraft as the airlines operate.

The fact that the business airplane can go to thousands of cities, while the airlines serve only about 600, has developed an ever-increasing community of interest between airline and private flying. Relatively few of the several hundred cities served by the airlines receive what could be reasonably called frequent service. Thousands of other cities have no scheduled airline service at all. This simply means that the small airplane feeds increasing amounts of traffic to and from the airline centers.

The established growth trend in general aviation is dramatic. It is not just expanding gradually, it is expanding by leaps and bounds. Production of general type aircraft has more than doubled in the five-year period 1954-1958.



By CECILE HAMILTON
Managing Editor

TO PARIS BY

Flying the Atlantic in a well-equipped light twin-engine business plane is an experience every pilot would enjoy, particularly when the weather cooperates.

Entire crossing looked much like this view taken from 11,000 feet and over the usual broken undercast.

Pico Alto, rising more than 7,000 feet above Pico island in the Azores, was first landfall on the 1,600-mile hop from Torbay, Newfoundland.

Landfall on 880 leg from Azores was this bit of Portuguese coastline near the famous resort of Estoril, about 15 miles east of Lisbon.

Refueled, radios adjusted, and baggage being loaded, Commander Six Eight Zero Echo is ready for take-off from Boston for flight to Torbay.

AERO COMMANDER

AN INVITATION TO FLY TO PARIS in an Aero Commander 680E is hardly one to be turned down by any pilot, and certainly not by this one. I had flown the Atlantic a number of times in commercial airliners, but never in a light twin. And it had been 25 years since I had flown a plane around in Europe—an experience I can heartily recommend to all pilots; believe me, that's the way to see Europe.

Ferry flights of light twins across the Atlantic have been accomplished in sufficient numbers in the past few years to make the crossing by a well-equipped 680E seem comparatively routine. The only unusual factor in this instance was that the command pilot would be a woman, Miss Jerrie Cobb, who had recently set a new world speed record in a 680E and previously had established world records for distance and altitude in Aero Commanders.

However, being a woman pilot myself, I naturally saw nothing out of the ordinary in this circumstance and, on the contrary, felt that her knowledge of the aircraft as well as her previous experience in flying the Atlantic made her particularly well qualified for the flight. Twenty-eight years old, Jerrie has logged some 6,000 hours, the majority on long-range ferrying operations, including 12 Atlantic crossings, piloting C-46s, C-47s and B-17s for an international ferrying outfit. She also had made a number of flights to South America ferrying AT-6s and PBYs.

The other member of our crew would be James Watson, service manager for Aero Design and Engineering Co., manufacturers of the Aero Commander line. Jim, like myself, is not a professional pilot. We both fly single engine aircraft, strictly VFR. He's a service manager and I'm a managing editor—we leave the professional bit to pilots who can concentrate on professional proficiency. So this would be Jerrie's flight, with assists from us.

Fresh off the production line, our aircraft had 14 hours break-in time when Jerrie and Jim arrived with it at New York International from the plant at Bethany, Okla. A straight production model being delivered to Paris for Jerrie to demonstrate at the Paris Air Show and later throughout Europe where it would be sold, the only non-regulation feature was a 90-gallon auxiliary tank installed in the cabin. Normally a seven-seat cabin arrangement, the three-place rear seat had been removed and would be shipped to Paris by air freight. The tank itself was rather special, having been built to FAI specs for Jerrie's record flights, so was a rectangular affair which somewhat blocked the entrance doorway but was otherwise inoffensive. Usual ferry installation would have been two utilitarian 55-gallon drums. A pressure pump in the baggage compartment behind the tank provided necessary boost for the fuel to the main center tank. Normal fuel load in a 680E totals 223 gallons—33½ in each outboard wing tank, and 156 in the center tank. With the 90-gal. aux tank, we had 313 usable gallons—enough for 10 to 10½ hours at 55 per cent power, or maximum range, with any luck, of better than 2,000 miles.

Route decision for the crossing depends pretty much on weather although the northern route via Iceland and Scotland offers the additional advantage of alternates on the long stretch to Iceland. There's nowhere to go en route to the Azores, and you either make it into the civil field at Santa Maria, or about 150 miles short of there to the military base at Lajes, which has GCA.

Jerrie decided on the southern route—we had a bit of sightseeing in mind and were looking forward to the flight from Lisbon across Portugal, Spain and France to Paris. Jerrie and I both knew Scotland and Iceland from away back and, since this was Jim's first European trip, he went along readily with our sightseeing plans.

After all, this was not to be any kind of "record" run—we weren't trying to prove anything. We had plenty of time to make a safe and comfortable crossing, spending a night at each fueling stop—Torbay in Newfoundland, Santa Maria in the Azores, Lisbon and possibly Madrid. We could wait out at these points the worst of the Atlantic's weather and the 680E's performance should take care of any marginal or unpredicted weather encountered.

For this is quite an airplane. Basically the same air-

craft as its predecessor models, the first of which set a record for single-engine performance by spanning the continent from take-off to landing on one engine—the 680E has a five-foot increase in wingspan which gives it some 500 pounds extra gross without any appreciable loss in speed or range. With its two Lycoming 340-hp supercharged, gear-driven, fuel-injection engines and Hartzell three-bladed, constant-speed, full-feathering props, it has a top speed at 10,000 feet of 255 mph, cruise at 10,000 and 70 per cent power of 226 mph. Our particular plane was also equipped with deicer boots on leading edges of wings, empennage and prop blades.

Supercharging, which operates automatically, gives the 680E a service ceiling of 25,350 feet and, as Jerrie demonstrated in Europe, it does nicely at 28,000. While the cabin is not pressurized as is its companion model, the Alti-Cruiser, the 680E has a seven-unit Scott oxygen set installed in the cabin which, incidentally, we did not need at any time on the crossing.

Sales coordinator and pilot for Aero Design & Engineering Co., Jerrie Cobb holds three world records, has flown Atlantic many times.

Communication and navigating equipment in our plane included a full set of Collins radios—VHF transceiver, separate VHF receiver, standby 90-channel VHF transmitter; omni with glide slope and marker beacon receiver; HF transceiver; and ADF/LF receiver. In addition to the usual full gyro panel, we had a Sperry Gyrosyn compass with remote unit.

Pilot and co-pilot panels were duplicates with the exception that the pilot's air speed indicator read in knots and the co-pilot's in miles per hour; and the pilot's altimeter was calibrated in millibars, while the co-pilot's was in inches of mercury. Needless to say, when I was not up front, I rode the rear seat behind the pilot so I could watch the co-pilot's panel diagonally in front of me. Center panel contained the engine instruments and was visible from both rear seats.

To supplement the two timepieces on the panels, the three of us kept our watches on three different time zones —Jerrie's on Greenwich for operations, Jim's on whatever local time we were trying to live on, and mine remained on Eastern Daylight to keep track of activities back home. In nothing flat, of course, we lost all track of normal time —eating when we were hungry and sleeping when the schedule called for it.

After experiencing some radio adjustment problems plus a day of driving rain and fog which grounded trans-Atlantic airliners to say nothing of our bird, we finally got off from Boston the morning of June 4. As this was an export aircraft, we had a full load of papers—export license, carnets, etc., but experienced no difficulties whatever in clearing Customs at Boston. This was to be true throughout the flight and I can only surmise that either the many reports that come to my desk of Customs and immigration troubles around over the world are way off base or the pilot in such cases should have been an attractive gal like Jerrie.

Since our registration number was N680E, we were "Commander Six Eight Zero Echo" to the dozens of voices that were to talk to us across the Atlantic and up through southern Europe to Paris. And these voices were, for me at least, the most interesting part of the flight. As long as your radio is functioning, you are never alone, with a constant stream of talk back and forth between ground stations, radar picket ships, ocean weather stations, traffic controllers, and other aircraft in flight. Twice we encountered radio relay problems—once, when only a hundred miles southeast of Newfoundland, we could not contact Gander Control but were picked up loud and clear by New York Control which relayed for us to Gander; and again, between the Azores and Lisbon, when a TWA Connie asked us to relay to Lisbon his ETA at Casablanca since he was unable to raise Lisbon but heard us talking to them.

On the long hop from Newfoundland to the Azores, we were amused to be queried twice—once by a radar picket ship and again by ocean station Delta: "Are you a female type?" They seemed genuinely pleased to talk to a woman, the Delta operator commenting that they had been on station for 20 days, and adding somewhat irrelevantly that surface weather at the time was 400 feet, visibility one-eighth of a mile, with fog. We gave him our sympathy, reporting that at 11,000 feet we had clear skies and unlimited visibility.

Weather throughout the trip was excellent, with only 20 minutes of instrument flight when we passed through the equatorial front that usually lies between Newfoundland and the Azores. And even there we were guided past the worst of the front by a defense picket ship, going off his scope just as we entered the storm area. However, climbing to 14,000 we encountered no turbulence and picked up only a minor amount of ice.

For some reason we were never able to get an en route reading on weather at Santa Maria, until about an hour out when the controller, speaking in very patient but heavily accented English which we had difficulty understanding, finally tired of repeating his carefully detailed report of cloud coverage and visibility and gave it to us straight, "Weather at Santa Maria is good . . . weather at Santa Maria is good!"

Flight procedure on all hops was simple: climbing to cruise altitude, usually 11,000, cruise control was set up and the ship trimmed out. In a 680E this involves reading the manifold pressure and tach settings off a chart, then matching these by pulling the throttles back to line up with the manifold reading, and the props with the rpm. Mixture control is automatic so once the trim is established there's nothing to do but rest your hands on the controls and follow a needle.

Navigation was an equally simple process of ADF homing, with the exception of some 200 miles in the area of the front when we rode a compass heading until picking up Delta's signal, which they were good enough to leave on continuously for our use until we had passed over, gone beyond and picked up the signal from the Flores islands which lie about 100 miles northwest of the Azores. All communications were HF from the time we left Boston Tower until we contacted Lisbon Tower on VHF.

The flight from Boston to Torbay, 974 statute miles, was made in 4 hours 32 minutes. Visibility was excellent. We checked the operation of our aux tank en route, running down the center tank and then transferring our extra 90-gallon load to it. All worked smoothly. On the ground at Torbay, a joint civil-military (USAF-RCAF) field serving St. John, Newfoundland, we en- (*Continued on page* 88)

TRANSITION TO TURBINES

INTRODUCTION

Is turboprop transition hard or easy?
Am I too old to fly turbines?
How long must I go to school and what must I study?
What about the availability of jet fuel?

These are only a few of the questions being asked by corporate and business plane air and ground maintenance crew personnel as the day draws nearer for them to exchange familiar piston-engine transports for brand new turboprop or pure jet varieties.

In the 15,000-pounds-plus class of jet age transports, the new Canadair, Grumman, Fairchild and Lockheed models are being phased into operations. Behind them will come the pure jet business planes.

Now that turboprop equipment is available, what is conversion like?

FLYING has taken these questions and many others to pilots, maintenance chiefs, airline operators, manufacturers and airline managements. It is compiling the opinions and views of experts who have completed or who are in the process of completing transition to turboprops.

Beginning with this issue, FLYING presents a series of articles dealing in these areas of interest. All include complete, up-to-the-minute reports of operations and experience.

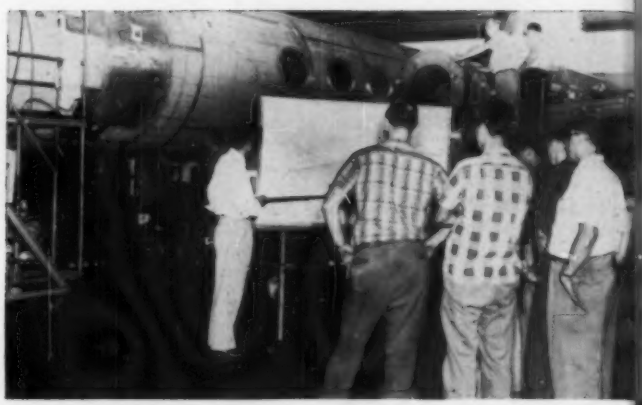
The human aspects of transition will be accented. FLYING will pass on tips from men who have broken off old habits and thinking on the ground and in the air to match new plane concepts and requirements. It will present their views of new procedures and techniques.

Many a pilot and mechanic is now hard at work 'boning up' for the classroom task ahead. And, as one veteran DC-3 pilot put it, "When you've flown one airplane for 20 years, it takes a lot of mental housecleaning to set your mind right for turboprops."

FLYING intends to help in this important communications effort.

Happy day! A corporate air crew forsakes the good ol' Gooney Bird for the jet age Grumman Gulfstream.

The mythical bugaboo facing piston-power pilots in making the change-over to turboprops and pure jets has yielded to concentrated study on the ground and in the air.

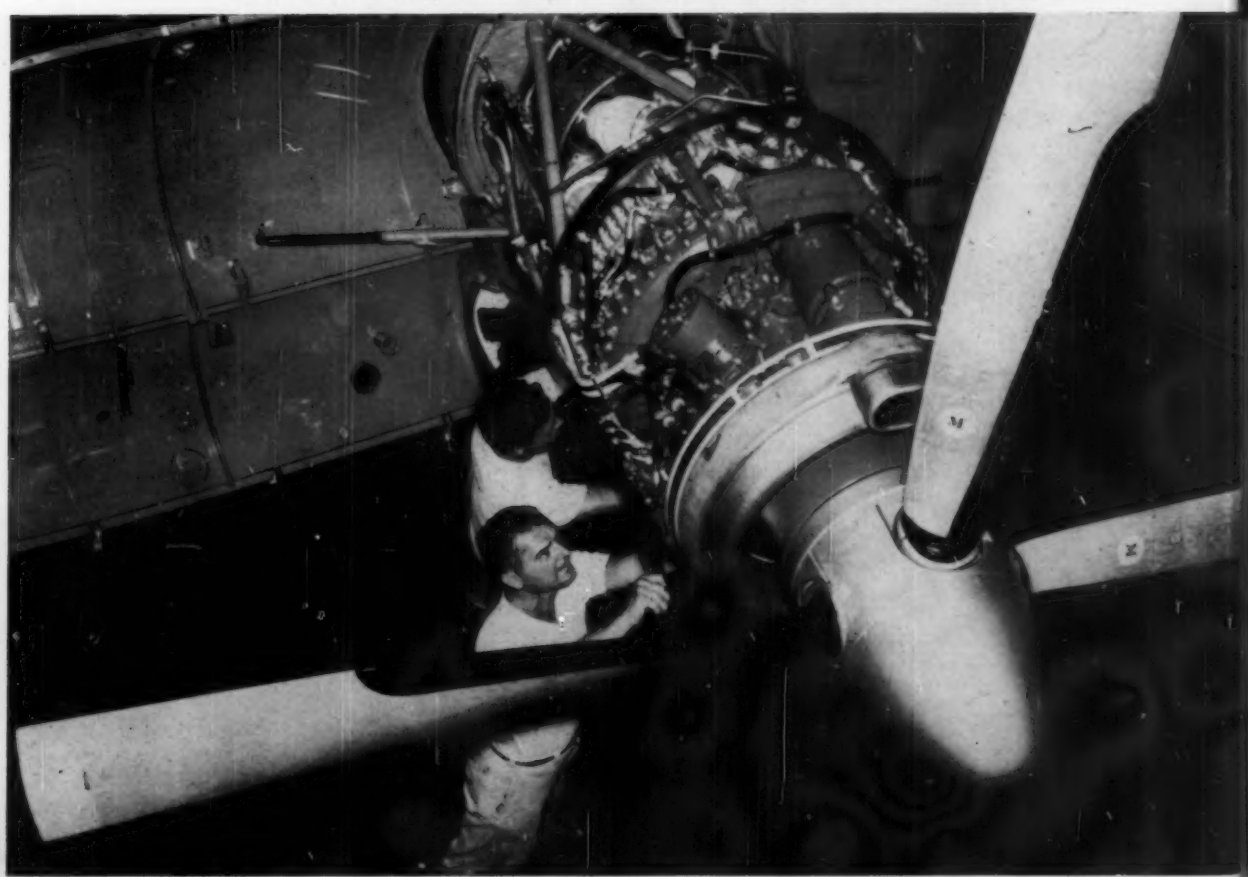


Instructor Ernie Laudenback gives some pointers on Gulfstream operation and maintenance to students at Grumman's transition school.

TRANSITION TO TURBINES

By LOU DAVIS

Pilots and crews alike appreciate the ground maintenance features of the Rolls Royce Dart engine.



CRUSTY OLD HANDS at corporate business flying are laughing at the prophets who have said transition to jets will be a monumental task for pilots and mechanics who have been flying and nursing the same kinds of birds for ten to 20 years.

In fact, the reverse situation has developed. There are only a few cardinal rules to fly by and, if they are adhered to rigidly, flying turbine equipment will be a cinch.

Curly Korp, chief of flight operations for Westinghouse, Pittsburgh, indicates that there is one fact of life which cannot be ignored—turboprops are not as forgiving for carelessness or mistakes as are the recips. The penalty for goofing-off and guessing is more severe.

This statement sets the theme for transition training

Above: Instructor-pilot John Jeffries, in "front office" of Gulfstream, checks out "student" on flight control procedures and systems. Right: Flying turboprops calls for strict adherence to flight manuals.

schools being operated by Grumman Aircraft on Long Island, by Fairchild Engine and Airplane in Hagerstown, and by Canadair and Rolls-Royce, both located in Montreal, Canada.

To date these four companies have given transition training to more than 300 members of corporate flight personnel. Grumman has approximately 30 to 40 "students" in current classes, Fairchild reports 15 pencil-chewing "scholars." Rolls-Royce, who trains a large percentage of the same people at its Dart engine school in Montreal has 12 pilots and mechanics in two-week class at this time. This figure does not include the 1,000 plus airline personnel trained at Fairchild and Rolls-Royce.

For a closer look at training philosophy and actual classroom schedules, your FLYING correspondent spent several days on the training room scene with Grumman Gulfstream transition training instructors. A report on that visit provides an excellent insight into the training program for business flying personnel.

The Grumman Gulfstream is a low-wing, 350-mph turboprop designed especially for corporate or business plane service. Its twin Rolls-Royce Dart engines provide comfortable travel for ten to 12 passengers in pressurized cabins at altitudes of 25,000 feet for long haul distances of 2,000 miles or more.

The Gulfstream, which weighs 33,600 pounds fully loaded, incorporates the latest in design concept, automatic systems concept and cockpit instrumentation.

The latest fail-safe philosophy has been applied to the Gulfstream to provide the maximum reliability and ruggedness necessary for long trouble-free operation.

Henry Schiebel, Jr., director of commercial sales for Grumman, says "Everyone expects pilot transitioning to turboprops to be involved and rugged. In truth, it's easy. The majority of the work is nothing more than study of manuals and the working out of flight problems."

In fact, pilots who have been through the air work agree with Henry. The airplane is easier to fly. There is less actual work for the hands, controlwise. At times, "we wind up with nothing to do with our hands."

Grumman instructors and graduate students say the toughest part of turboprop conversion is getting used to following prescribed operations from the moment a flight is planned until it has been completed. Due to the difference in operating characteristics, gas turbines mean that fuel consumption must be monitored at all times. Actually, since the engines are inherently simpler with less cockpit instrumentation, fuel consumption in relation to airspeed constitutes the major effort, other than normal navigation and airways control procedures.

Grumman follows no set pattern for flight transition of pilots. The routine operation first includes landings, take-offs and then operations designed to give the crew the feel of the turboprop in stalls, climbs, let-downs, single-engine procedure, and other emergency type of flight drills.

Operations at altitude include, of course, fuel management and cruise control, in-flight familiarity with deicing systems, weather radar, cabin pressurization and air conditioning equipment.

Like all fast clean airplanes of the gas turbine-powered type, speed control is a must in all attitudes and conditions. Unlike the old Gooney, overspeeding occurs quickly—and this can mean trouble in a hurry. Now the air crew must exercise as much care against flying too fast as they do on the low speed side of the scale for conventional aircraft.

Every air crew member is due to spend more time monitoring a Safe Flight indicator in climb, cruise and landing flight regimes. This handy instrument is mounted directly in front of the plane commander. Although the indicator itself is not standard equipment on the Gulfstream, distributors will install it. Fairchild installs it at the factory.

Some individuals have more difficulty changing old habits than others. The flight portion of the program is kept flexible so that instructors can ferret out these individual differences and spend sufficient time to break the habits.

One such habit, which occurs frequently, is the tendency for the pilot to duck the nose immediately after take-off to clean up the airplane and gain speed before the climb-out. This is not necessary in turboprops since speed acceleration is rapid and planes such as the Gulfstream and the F-27 climb best at high angles of attack. In fact, one corporate pilot says, if this old DC-3 habit is repeated on a turboprop, "you're liable to wind up dribbling your partially retracted wheels down the runway."

Grumman invites all personnel—flight or maintenance—to complete its three-week ground school course on maintenance and operations of the Gulfstream. Pilots and co-pilots are urged to take at least the first week of general indoctrination. They have found that after the first week most aircrews stay with the program for the full period and often go to the Rolls-Royce school at Montreal for detailed orientation on the Dart powerplant.

Grumman's veteran Service (*Continued on page* 100)

THE AIRMAN'S WORLD

Once it was lore of the open road
and romance of trackless sky

But now it's the lure of power and gold
that calls for the ships to fly;

Once 'twas a game for the restless ones
—the young and the brash and bold

But now it's a tycoon's travelled trail
in struggle to have and hold;

And thus has it been since time began
wherever the paths have gone

The young must first see over the hill
and the builders follow on.

The wings I rode in the days of yore
are not for the present skies

And I have no gold for the wondrous wings
—such wings as the tycoon flies;

But my heart lifts up on cambered dream
to follow his contrail sign

For he had not built across the hill
unless he had followed mine;

And thus has it been since time began
wherever the paths have gone

The young must first see over the hill
and the builders follow on.

GILL ROBB WILSON

By COL. WILLARD F. ROCKWELL

Chairman of the Board, Rockwell Standard Corporation, Rockwell Manufacturing Company and Aero Design and Engineering Company

Why we entered business plane manufacturing

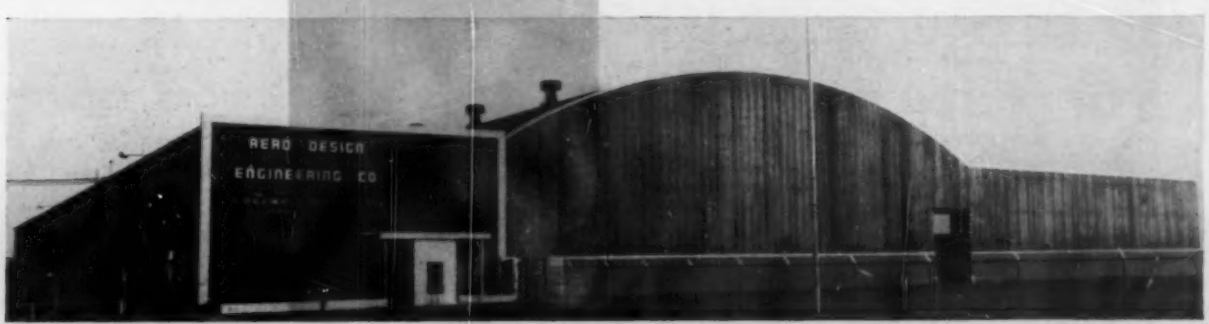
Col. Willard F. Rockwell

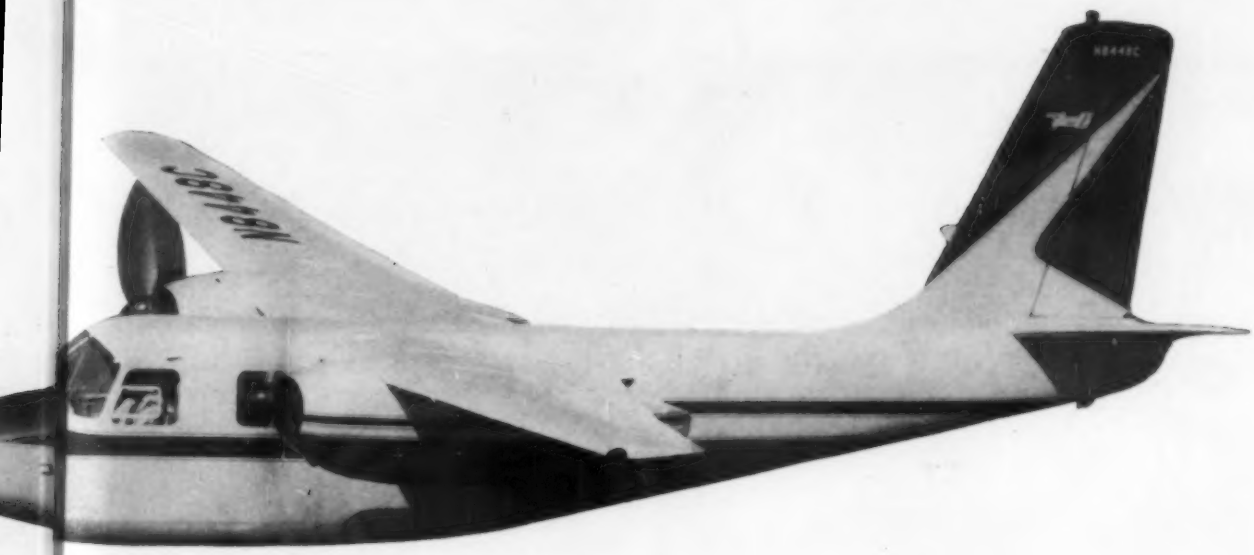
When Rockwell-Standard Corporation, one of the nation's largest suppliers of parts to the U. S. automotive industry with sales of $204 million in 1958, entered the business aircraft manufacturing field with purchase of the Aero Design and Engineering Company, manufacturers of the Aero Commander line of light twin-engine business aircraft, the move was heralded as a healthy sign by the aviation industry, if somewhat startling to the non-aviation industrial and business world.

Head of the Rockwell industrial complex is clear thinking, hard driving Col. Willard F. Rockwell who over the years has received numerous awards in America and abroad not only for his industrial achievements but even more significantly for his active support of free enterprise. An MIT man, class of 1908, he directed America's record-breaking merchant shipbuilding program during World War II and in addition served on the Executive Committee of the Army and Navy Munitions Board and the Requirements Committee of the War Production Board. In 1953 he served as special assistant to the Secretary of Defense, reporting on the European production situation and representing the Defense Department at NATO conferences in Paris.

We are proud to present Colonel Rockwell's straightforward analysis of his company's reasons for entering the business aircraft manufacturing field.

—THE EDITORS





FIFTY YEARS of growth and progress—this is the mark of Rockwell-Standard Corporation which is celebrating its Golden Anniversary in 1959.

Until recently the achievements of the company and its predecessor firms have been almost entirely associated with the automotive and related industries. The Timken-Detroit Axle Company and Standard Steel Spring Company, predecessors of Rockwell-Standard, were leaders in their field before consolidating in 1953 to form the Rockwell Spring and Axle Company which then became Rockwell-Standard Corporation in 1958.

Rockwell-Standard has continued to maintain the leadership that these two fine organizations established. For example, the company is the world's largest manufacturer of axles for trailers, trucks and buses, and the products of the Corporation have earned an outstanding reputation for excellence and quality. We are proud of this reputation.

The benefits of diversification of industry are well known. It is obvious that Rockwell-Standard would be examining possibilities for growth and expansion through new product development, as well as by acquisition.

The company has had a deliberate policy of diversification through both of these channels. While no arbitrary set of criteria has been laid down as a guide, there are a few policy considerations which are matters of common sense in such a program.

First, the product to be developed or acquired must have profitable growth possibilities. There is no altruism in our plans for diversification. We have been a profitable company and we are proud of this. We offer no apologia for profits which are the life blood of our free enterprise system.

Next, the product should have some appropriate relationship to our main activity which is manufacturing.

Third, the product should have a degree of quality and excellence of performance that will permit it to take a place among other Rockwell products which have earned leadership in the market place.

Fourth, in cases of acquisition, the firm involved must have an adequate and strong management group that will provide growth without requiring direct management participation from our corporate headquarters staff. We are not interested in weak sisters.

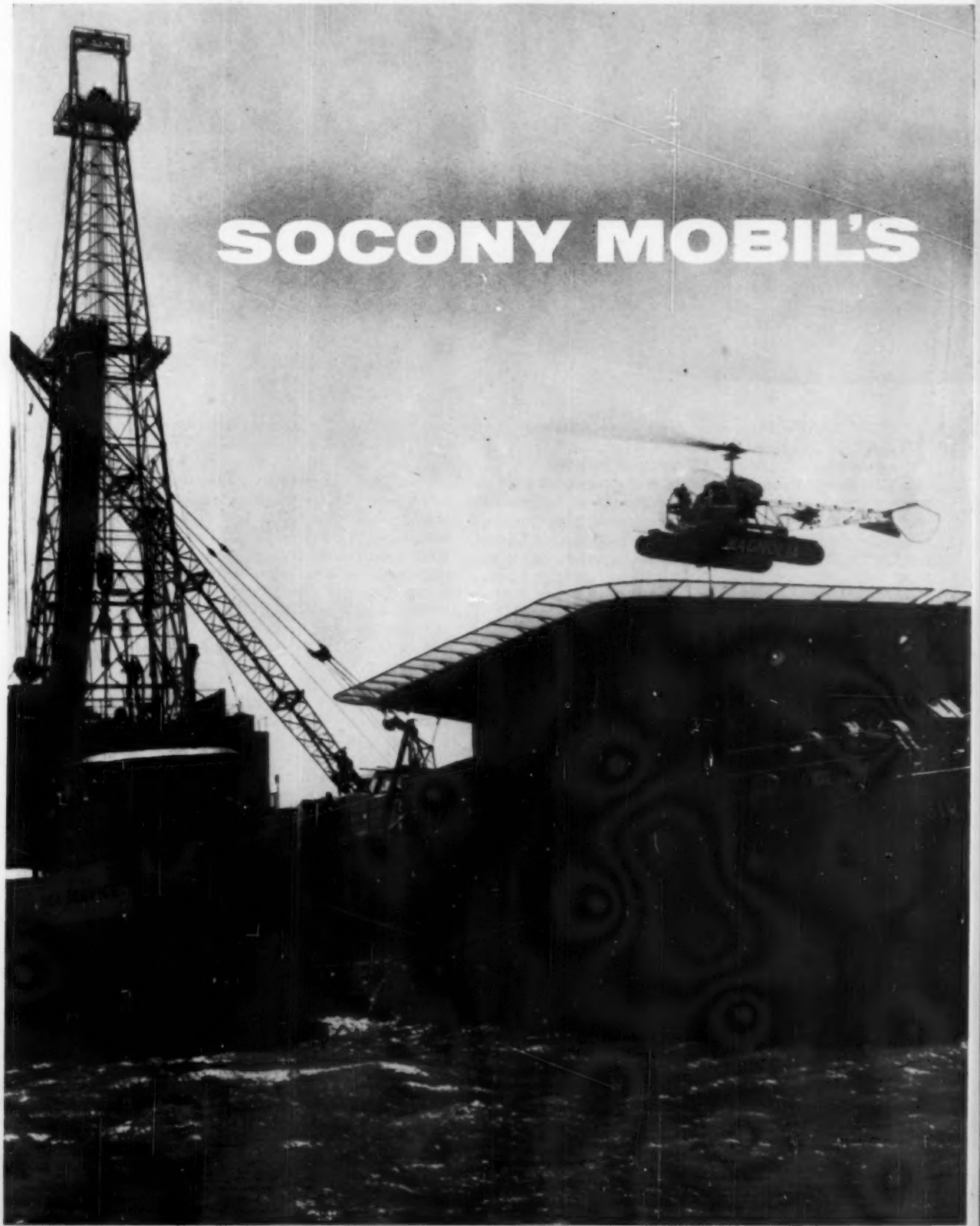
In moving forward with diversification, it is natural that Rockwell-Standard would have examined the aviation industry. The phenomenal growth of aviation and its significance in our economy would make it a logical place to look.

It is not a place to leap blindly, however. There are many worthwhile aviation ventures that would seem to qualify for our program but which fail to meet all our requirements. This is particularly true in the case of the profit requirement. We are captivated by the romance and glamour of aviation—but not to the point of putting our money into it except on a sound businesslike basis. We recognize that the enduring faith and vision of our early aviation pioneers brought this industry into being long before there seemed to be any real hope of profits, and pioneering ventures must always have this support and encouragement. However, there are many going concerns in the aviation industry which seem to be operated for the sake of being in aviation rather than for the sake of running a profitable business. In our minds the aviation business is first a business—then aviation.

Government policies on research and development operate to make satisfactory profits very difficult among airframe manufacturers. So much so that today much of the government's airframe procurement is built by private companies, but in government-owned plants with government-owned tools and fixtures. This does not seem to us to be a sound basis for our entrance into aviation and we determined to avoid it.

For example, we are engaged in the research and development of a VTOL aircraft by Robertson Aircraft Corporation, a subsidiary of Aero Design. This, a first in the field which has particular significance for the Army, is one that has been conceived, initiated and carried forward in its entirety by private capital. We are hopeful of the success of this venture and of the ultimate profitability of the undertaking. We believe it is only through the exercise of individual ingenuity and the stimulus of private venture, coupled together with the flexibility of free business management, that the inventive and innovative capacities of this country can be released for the use and application by the Military.

We are interested in and want government business but we don't want a firm in which the government is running the business for us. This not only rules out many aircraft manufacturers but causes hesitation about entry into air transport. Federal regulations in the airlines business have already usurped much of (*Continued on page* 78)



Helicopter of Magnolia Petroleum Company, Socony Mobil's southwestern U. S. affiliate, alights on an offshore oil drilling rig in the Gulf of Mexico.

Based wherever the need is greatest,
this petroleum company's fleet of many types
of aircraft places emphasis on utility.

FLYING RED HORSES

FROM THE ARCTIC TO THE SAHARA

By CAPT. CHARLES E. MORRIS
Manager of Aircraft Operations, Socony Mobil Oil Company, Inc.

TIME: APRIL, 1943. The sky over Libya is filled with the white puffs of artillery ack-ack. Below, the armored tanks of two battle-hardened armies weave and maneuver over desert sands pockmarked by the explosions of shell and mine.

Droning sounds pierce the sky as attack bomber and fighter plane seek the enemy. An explosion shatters the ears as a tank is blasted out of action. The tank has struck a land mine.

It is early Autumn, 1958. A giant truck moves slowly along one of the practically non-existent Libyan roads. Suddenly, there is a violent explosion. The truck is badly damaged.

Two months later the front end of a jeep is blown away as it moves along another desert road. Amazingly, no one is killed.

The vehicles had struck two of the land mines which still dot the desert of this North African country. Unfortunately, far too many land mines still remain, waiting only to be tripped to carry out their destructive mission.

To avoid just such accidents, Mobil Oil of Canada, Ltd. (a wholly-owned subsidiary of Socony Mobil Oil Company, Inc.), which has been exploring and drilling in Libya since 1956, has substituted air travel for land transport whenever possible.

To support its exploration and drilling program in the Sahara, the company purchased a deHavilland Beaver in 1956. The reason was simple enough—rapid and safe transportation of personnel, and perishable and emergency supplies across the hot sands. Trucks had been averaging 12 miles an hour cross-country. Some had been temporarily lost (then found by search aircraft) and, in the cases of the mine-hit truck and jeep, extensively damaged.

Another advantage of using aircraft was the ease with which landing strips, after first being cleared of mines, could be graded on the flat terrain.

As activity increased, a DC-3 was added. In 1957, it was put to work carrying cargo and personnel to the drilling and seismograph camps. In addition, it has flown emergency missions carrying injured personnel and essential rig parts.

(*Continued on page 104*)

Mobil Oil of Canada operates deHavilland Beaver (in flight above) to bring supplies to their Alberta exploration site. Delivery is completed by dog team (below).

How

A company-operated air transport system has proved itself to be a very definite business asset to this large manufacturer.

By **CHARLES F. ADAMS**
President, Raytheon Manufacturing Company

The author.

Top: Newest addition to Raytheon's air fleet, the Fairchild F-27. Above: Part-time stewardess, formerly with the airlines, completes the turbo-prop's crew. Right and opposite page: Four of the company's planes, left to right, Bonanza, F-27, Twin Beechcraft and in the rear, a Lockheed Venture.

Raytheon makes travel time working time

AS A BUSINESS tool, Raytheon's fleet of company-operated planes is an invaluable aid in converting travel time into working time.

No longer can our executives, managers, engineers and other key personnel step from the office to the automobile and, within the hour, be in contact with their daily problems. Raytheon's 34 plants and laboratories are located in 24 different cities in eight states and one Canadian province. Some of these cities have no more than token scheduled airline service. Many of the companies with which we do business—such as International Business Machines in Poughkeepsie and Owego, N. Y.—are located in communities not served at all by the airlines, or if they are, inadequately.

Today, as decentralization spreads, our people must travel hundreds or thousands of miles to coordinate and direct our affairs. By using company-operated planes they can greatly increase their productivity.

Last year, Raytheon's company-operated transport aircraft completed 684 out of 684 scheduled flights in full safety for a 100 per cent operating record. These planes—a Lockheed Ventura, a Twin Beechcraft E 18 S, a Twin Beechcraft D 18 S, a Beechcraft Bonanza, and a Piper Apache, plus a rental craft on occasion—flew a total of 3,708 hours, covered 642,853 miles, and carried 3,364 passengers some 2,312,756 passenger miles. The longest flight was 4,600 miles; the shortest, a hop of 25 miles.

In addition to this passenger record, company planes carried 77,419 pounds of priority cargo, such as missiles from one of our plants out to White Sands, N. M., for testing.

The total cost of this transport aircraft operation was $389,092. Broken down, the cost per hour of operation for all types of transport flying was $104.92.

In analyzing these costs further, we find that we are operating our Twin Beeches and our Bonanza at below airline fare rates for number of passengers flown—and this includes all costs: pilots, insurance, administration, mechanics and overhauls. On the same cost basis, we're operating our Lockheed Ventura—with seven passengers per flight—at no more than airline rates. If we haul more than seven passengers in the Lockheed, which is designed for ten passengers, or 11 if we use the jump seat, we operate at below airline fare costs. If we carry fewer than seven passengers on a flight, then the cost is more than for commercial air rates over comparable distances.

Despite our own flight operations, Raytheon is still the biggest individual customer the scheduled airlines have out of Boston, which is not far from most of our major offices, plants and laboratories.

Just recently we have added a Fairchild F-27 turbo-prop transport—outfitted to carry 19 passengers—to our corporate fleet. With this larger and longer-range plane, our flight department has inaugurated a four-day-a-week scheduled airline-type operation, linking the Bedford Airport, only a few minutes from our home offices in Waltham, Mass. to Washington, D. C., Dayton, Ohio and Bristol, Tenn.

(*Continued on page* 106)

PAY AS YOU

A pioneer in the field, Beech became the first aircraft manufacturer to offer business plane financing and leasing at the customer level.

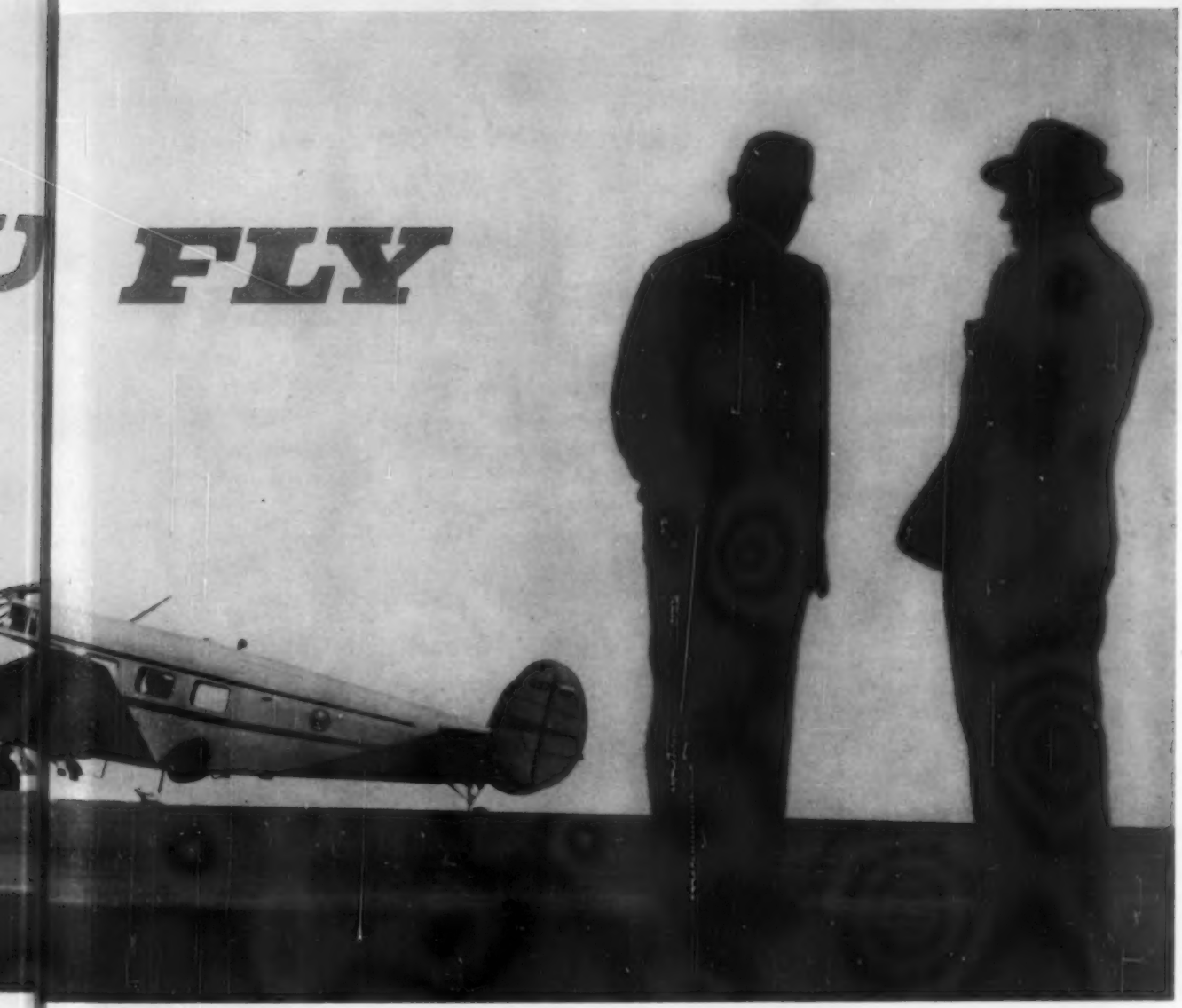
By JOHN R. GRAHAM

A PLAN FOR EVERY BUDGET—that's the key to rapidly expanding marketing activities of Beech Acceptance Corporation organized in 1956 to lease and finance executive airplanes. So successful have been its various "pay as you fly" plans, in fact, that many financial institutions are now adopting Beech contract forms and methods of computation as basic criteria for their own credit terms.

"Hardly a day passes that we fail to receive an inquiry from a bank or concern interested in aircraft leasing and financing," says A. R. (Ding) Bell, subsidiary vice president. "Most are experienced in handling paper on surface vehicles, but until recently they had considered deferred time payment on airplanes a bad risk."

Because of convenient installment programs, more and more business firms are finding profit in private aircraft utilization without the necessity of large cash investments. In its nearly three years of operation, BAC's combined plans alone have produced more than $41,500,000 worth of new and used commercial aircraft business. Response is

Right: A prospective purchaser eyes a Beech Super 18 with a view to financing the deal through the Beech Acceptance Corp. Below: Super 18s on the line at the factory in Wichita.



further evidenced by the fact BAC's conditional sales in fiscal 1958 climbed to more than $12,000,000 compared with the 1957 volume of approximately $10,800,000.

"And retail financing by the close of the current fiscal year will easily top the '58 total," Bell adds.

The parent company's experience in the field actually dates back to 1954 when Beech pioneered "floor plan" financing for its distributors and dealers. Today, its subsidiary offers three different finance plans—computed by straight line, sum of digits and declining balance methods respectively, with hull coverage included—and two attractive leasing plans, one extending over four years, the other —five years.

"All finance and leasing plans are applicable to new and used Beechcrafts—the Super 18, Twin-Bonanza, Travel Air and Bonanza," says Bell. "In addition, all acceptable makes and models of other used airplanes offered by our distributors and dealers can be financed or leased through BAC."

In these days of shrinking dollars, it's not surprising that some of the nation's largest and most financially sound corporations prefer to buy their planes on time—it is simply good business. Smaller companies, too, are discovering the many advantages of financing as opposed to cash purchases. For those desiring to lease, BAC rental agreements are the first in the business aircraft industry to feature options to buy, "escape clauses" and second plane leasing opportunities in one package.

Through financing, companies realize the manifold benefits of personal air transportation and at the same time conserve working capital, releasing funds for other vital needs. It enables them to maintain cash reserves; low monthly payments can be made from current income and increased profits. They can expand their operations, increase inventories and boost sales while steadily acquiring a full interest in their airplanes.

Each BAC finance plan offers special group insurance rates. And each leasing package includes full hull and passenger liability coverage. All plans provide tax advantages. Fast "write-offs" during early years of ownership or tax savings at constant rates are possible; each finance plan is tailored to a tax (*Continued on page* 112)

Typical of Dallas businessmen beginning to get the aviation fever, is 52-year-old A. C. Stults, petroleum engineering firm executive, shown here plotting his course of next training flight under supervision of SAC Director of Flight Training, Jim Bellamy.

STRAW

By A. L. HOSFORD

WIZARDS ON THE SUBJECT, and they are legion, say that most new airplane sales are made to folks who already possess, fly, or ride in airplanes of one kind or another. This is logical but not especially heartening. However, the private plane industry does, too much of the time, resemble a camel, deriving a considerable amount of nourishment and comfort from a hump atop its own anatomy.

Some 18 months ago, Southwest Airmotive Company, located on Love Field at Dallas, Tex.—one of aviation's largest service operations and a firm that has tried its hand successfully at about everything else—decided to try going over that hump to sell airplanes to folks who'd never had 'em and who, for the most part, made it clear they couldn't care less.

Southwest Airmotive quit selling airplanes 20 years ago for a very good reason—it wasn't making enough money at it. A company long noted for aggressiveness, imagination, and a habit of doing better than average-well in whatever it attempts, SAC is typical of the large service operations which have developed at major airports over the country in the past two decades. Many of these companies dropped out of aircraft sales before or during the war and then never returned to the fold. Their post-war activities headed in the direction of service to corporate fleets, servicing and refueling airline and military aircraft, overhaul contracts for military and airline jet and piston engines, and distribution selling of parts and accessories to airlines and operators.

That Southwest Airmotive has now thrown its ten-gallon Texas hat into the aircraft sales arena is more than a "straw in the wind"—and the Texas dust is flying! For after taking a long look at the new plane market which it had deserted with gusto back in the mid-'30s, SAC drew a deep and prayerful breath and jumped right back into the middle again, this time with an established winner, Cessna.

In keeping with its Texas-type reputation for tackling the tough ones, SAC set its target smack downtown, in the middle of the untouchables—those business moguls who still think private planes are just-so-much-tomfoolery for crazy millionaires and wild-eyed kids.

As one of private aviation's busiest crossroads, Southwest Airmotive handles complete aircraft service for all types of single and multi-engine aircraft.

Southwest Airmotive's return to the aircraft sales scene is marked by the introduction of a "package plan of ground and flight training, charter and lease service" for the businessman.

IN THE WIND

Today, after more than a year of storming the walls, Southwest is a bit bloody and bruised, and somewhat wiser, but more determined than ever that thar's gold in them thar executive offices. They sincerely feel they're about to tap that fabled "new market" which aviation men have discussed at such great length but have done so little to penetrate.

However, SAC is the first to admit that, to date, it hasn't set the world on fire selling airplanes. While holding its own, it records no instances of inspiring a business-novice to rush out to the airport and overwhelm SAC salesmen with his check book. Sales are being made regularly—but the usual hard way. The important thing though is that Southwest does appear to be getting its story across to a previously deaf audience of businessmen outside the aviation fraternity.

The how and why of Southwest Airmotive's experience over the past 18 months in this new field of activity make significant material for study by observers of the aviation scene. The "why" is simple—the company's return to the aircraft sales scene stemmed from the same brand of hard-headed arithmetic that made them quit selling planes 20 years ago. Sharp figuring by president Harlan Ray and his partners, executive VPs Winston Castleberry and George W. Jalonick, III, indicated that selling airplanes now could be a very good thing indeed. Castleberry liked the prospect of providing additional service for the company's aircraft and engine shops, and for further corporate diversification. Harlan Ray, an oilman inactive in Southwest's day-to-day operations, summed up his feelings like this:

"I've got a lot of friends who could and would be using airplanes for business and pleasure, but they just don't have confidence in them. We've got a fine name in the community and folks trust us. If we can tie our name with an equally good manufacturing name, I know many, many people who'd be interested."

Then, still in character, Southwest hard-headedly researched leading manufacturers—the quality, variety and acceptance of their products, their plans for the future, and their distribution and dealership policies. Cessna's name emerged on top.

However, a Cessna distributorship is not acquired just-like-that. First SAC searched about for an established successful distributorship and found it nearby in Aircraft Sales Company, an 18-year-old concern with shops and showrooms at Meacham Field, Fort Worth, and at Gregg County Airport, Longview, Tex. Pilots had confidence in Aircraft Sales and over the years the firm had garnered a wallful of Cessna sales awards. The company's owner had reached the point in life when he wanted to withdraw from his scattered business interests and take things easy. He set price and terms. SAC accepted.

But you don't get a Cessna distributorship just-like-that, either. Long conferences were held in Dallas and at Cessna in Wichita, Kan., to determine just how an airplane sales and service mission would mesh into SAC's already loaded corporate pattern. Cessna wanted to make sure that Cessna didn't get lost in the shuffle. SAC officials made it clear that they didn't get involved in things to lose them but to use them profitably to the benefit of all parties. Cessna assigned the distributorship franchise to the new owners of Aircraft Sales Company. Here, in brief, is the way it's handled:

Business Wings, Inc., was formed to serve as Cessna distributor, with offices at Southwest Airmotive's main base at Dallas. Dealers presently are located at Dallas, Fort Worth, Longview, Wichita Falls and Abilene.

Southwest Airmotive Company itself was appointed a dealer in an arrangement which involves a concept and principle worth special mention. For many years, Dal-Tex Aviation, Inc., of Dallas' Addison Airport, has been the city's only Cessna dealer and a repeater as No. 1 Cessna seller in the nation. Cessna's survey showed Dallas, America's fastest growing city, is dynamic and air-minded enough to merit the attention of two dealers, and Southwest was appointed as the dealer at Love Field.

This was done not only with the cognizance and approval of Dal-Tex but with its active co-operation. Officials of the two companies agreed to work in harness in a plan of encirclement on Dallas. This has proved effective. With SAC busily trying to develop a prospect list of its own, Dal-Tex has gone right ahead to again re-establish itself as one of America's top dealerships.

SAC's first problem was that of staffing its airplane sales division. To head up Business Wings, the distributorship, it employed James H. Craddock, aviation sales manager of Humble Oil & Refining Company, who is a former airline captain, ex-chief pilot for Collins Radio, and a graduate lawyer, as well.

To direct the SAC Cessna dealership, the company turned to Cessna itself, making away with Gerald Spear, the plant's Texas-New Mexico sales chief. Incidentally, Dal-Tex got into the act and got itself a choice plum from the factory tree—Eldon Bloyd, Cessna western regional sales manager, whom it named president. Cessna winced but was good sport enough to observe that the boys would be out there pitching Cessna—so good luck and Godspeed!

SAC specialists made countless sorties to Aircraft Sales at Forth Worth and Longview and determined that both firms were succeeding; and so were left pretty much as was. Ernie Williams remains (*Continued on page* 114)

Ground school classes of the "air age package for businessmen" are conducted at night in one of SAC's new terminal offices.

MANGER HOTELS' PLANE—

'An Indispensable Business Aid'

The company aircraft is considered a vital piece of equipment in the operation of this rapidly expanding hotel chain.

By JAN BOGARDUS

IN FIVE SHORT MONTHS we have found that owning our own plane results in efficient use of executives' time, closer contact with all employees, the ability to cope with emergencies quickly and capably, and an effective means of developing sales."

So says Julius Manger, Jr., chairman of the board of the Manger Hotel Chain, who began flying as a hobby 20 years ago, and now finds his avocation an indispensable aid to carrying out his vocation. The noted chain, with ten hotels and two motor inns in eight cities, owns a single-engine, four-passenger Cessna Skylane. Since its purchase in May, 1959, the company has logged more than 20,000 miles, with Mr. Manger piloting himself and company executives to Manger Hotels in Washington, D. C., Savannah, Ga., Charlotte, N. C., Grand Rapids, Mich., Rochester, N. Y., Albany, N. Y., and Cleveland, Ohio. Manger also has two hotels in New York City.

Mr. Manger obtained his license in 1939 at Armonk Airport in Westchester County, New York, and piloted a Fairchild before purchasing his own Beechcraft in 1941. The advent of World War II curtailed his hobby for the duration, which he spent on an aircraft carrier from 1942 to 1945. Although he applied for combat pilot's training in the Air Force, at 26 he had passed the age limit.

He resumed his aviation activities in 1946 and 1947, flying an Aeronca, and boosting his total air time to over 300 hours. However, in 1947, the two top executives of the Manger Chain who had been associated with Mr. Manger's father and had carried on the business during the war years, died within a few months of each other. Manger had to step in as chairman of the board. His heavy post-war duties involved selling several of the chain's older properties, modernizing others, and buying new properties. This left him little time for flying.

It was only in the last few years, with the expansion program in full swing, that Manger had both the time to brush up on his flying, and also saw the need for resuming his hobby, this time in a business vein.

"With hotels as far-flung as Grand Rapids, Mich., and Savannah, Ga., I was constantly on the move, and seemed to be spending much of my time at commercial airports," says Mr. Manger. "For example, there is a limited number of scheduled flights from New York to Savannah, Ga. This is a two-day trip by automobile . . . now we can do it in a morning."

While formerly a visit to one of the out-of-New York hotels involved an hour or more drive to either LaGuardia, Newark or Idlewild Airport in New York, Mr. Manger can now drive from his home in Greenwich, Conn., to Westchester Airport, where the plane is hangared, in 15 minutes.

When the chain was started by Julius Manger, Sr., and William Manger in 1908, it was not necessary to travel so often or so far. According to Julius, Jr., "Not only were our properties closer together, (*Continued on page* 96)

HOW ATLANTIC AVIATION

SERVES BUSINESS FLYING

A basic company principle—
that in business aviation only
the best is acceptable—
is put in constant practice by this
fixed base flight operator.

By ALEX DAWYDOFF
Assistant Managing Editor

THE STORY of Atlantic Aviation has its beginning 32 years ago when aviation was just taking its first firm steps towards recognition as an important tool of world commerce.

Business flying, which has been in the spotlight of General Aviation for the last decade, did not "just grow like Topsy" overnight. Behind it there are 30 years of slow and even painful growth, not the least of which were the never ending process of selling stockholders on the value of an airplane as a business tool, and the unavailability of suitable aircraft.

The practicability of the airplane was never doubted by progressive businessmen once the craft reached the stage of reliability and capacity to carry loads. Certainly the fact that as early as 1929 more than 50 business and industrial concerns including oil companies, newspapers, hosiery, tool and automobile manufacturers, real estate operators, and others, owned at least one and in some cases a fleet of aircraft, is ample proof of the faith U. S. businessmen put into aviation as a link in the chain of progress.

With the growth and expansion of business flying, the whole concept of selling and servicing airplanes had to undergo a radical change. Informality was the keynote in the early days. Flying was regarded as a sport, on the par with automobile racing. Airplane salesmen had to be pilots and so were the purchasers. The buyer was, on the whole, interested only in the performance of the airplanes and cared little for creature comforts; marginal safety of some of the planes did not concern him as this characteristic was rather typical of a great number of early aircraft.

It is not surprising, therefore, that the entire philosophy of selling aircraft differed considerably from the practices of normal business procedures. Operators rarely had service and maintenance facilities, with the exception of those located at larger airports, who may have had a mechanic, a helper and a small stock of parts. Too often it was a case of "Joe in the hangar across the field is good with Wright Whirlwinds and Warner Scarabs; he does recovering too."

DuPont Airport at Wilmington, Del., about 1929.

Despite the unconventional business tactics which, in a lesser degree, still exist, there were those with foresight and vision who correctly interpreted the signs of business aviation potential then just coming into sight. It was obvious to them that only through application of true business principles would they grow and prosper. The steady expansion of business flying is largely due to these "visionaries" who have grown into the present giants of aviation's sales and service organizations.

Occupying a prominent place among them is Atlantic Aviation Corporation, whose system of fixed base operations includes five strategically located bases at Logan International Airport, Boston, Mass.; Teterboro Airport, New Jersey; Philadelphia International Airport; New Castle County Airport, Wilmington, Del.; and Preston Glenn Airport, Lynchburg, Va. The area

Boston Division

Teterboro Division

Philadelphia Division

Wilmington Division

Lynchburg Division

encompassed by Atlantic is one of the richest from an industrial and business standpoint and has, probably, the largest concentration of business aircraft.

Atlantic Aviation grew from a hobby of a prominent industrialist, Henry B. duPont, member of the world-famous Delaware family. DuPont and several of his cousins were among the east's earliest business aircraft users. In 1927, just outside of Wilmington, Del., Henry B. duPont built a wooden hangar on what was to be known as the DuPont Airport, to house and maintain airplanes. As aircraft service in those days was hard to come by and of doubtful quality, the operation soon had more customers than the existing facilities could accommodate.

The steady growth of business prompted expansion and commercialization of DuPont Airport. Additional hangars were erected, a control tower built, field lighting and range station installed, making it the first private airport in the United States to be so equipped. Simultaneously decision was made to go into aircraft sales and a distributorship for Waco airplanes was acquired. Distributorships for Piper and Beech followed. The newly formed organization was named Atlantic Aviation Service.

By 1938, continuous increase in business necessitated further expansion as the DuPont Airport could no longer handle the demand. As a result, facilities were leased at Roosevelt Field, L. I. and a new company, Atlantic Aviation Corp., formed to start a Beech distributorship in the New York area. Both divisions, Wilmington and Roosevelt Field, operated until 1941 when they closed down for the duration of the war. Prior to closing down, Wilmington conducted a Civil Pilot Training Program and War Training Service. Of the 29 airplanes Atlantic had on hand, it sold 28 by the time operations were suspended.

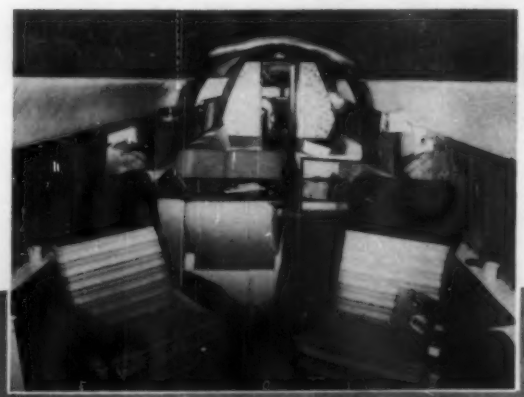
Active again in 1945, Atlantic Aviation erected a hangar at Teterboro Airport and in 1947 a branch opened at Bedford, Mass. In 1948 the sales activities of the DuPont Airport operation were moved into a new hangar at New Castle County Airport; then came the moves to Logan International Airport in Boston, and opening of the divisions at Lynchburg, Va. and Philadelphia, Pa., and further expansions of the Teterboro and Wilmington sites. At present Atlantic operations include approximately 400 employees and 14 hangars.

"The growth and success of Atlantic Aviation is a result of the ability, teamwork and sincere efforts of its management and personnel," says H. B. duPont, the company's founder. Serving presently on the Board of Directors, headed by Stewart E. Poole, Atlantic's president, Mr. DuPont often visits its various branches. An active pilot, he flies current model Beechcraft and occasionally, his own Wasp powered Stagger Wing Beech, which he has owned since 1941.

He and the Board of Directors are emphatic that success of Atlantic is based on the simple formula of solid business foundation, good customer and employee relationship, flexibility to adjust to the rapid change in pace and ability to see and plan ahead. "Aviation sales and services do not differ from any other business and the adoption of good business technique is necessary," says Watson E. Richards, executive vice president.

Correctness of the formula is attested by Atlantic's achievements. From 1946 to July 1959, it sold approximately 500 Beechcraft airplanes and in the neighborhood of 1,400 used aircraft. Eight $1,000,000 Grumman Gulfstreams have been sold in 1959. The Beech franchised divisions take about ten per cent of Beech Aircraft's commercial production.

But sales and service do not constitute the company's only occupation. It is also considered one of the leaders in design and installation, calibration and maintenance of electronic equipment such as radio, instruments, electronic control systems, all weather radar, communication and navigation systems. The quality of work and caliber of technical personnel engaged in (*Continued on page* 109)



Below: Atlantic purchased a tired old DC-3 of some 10,600 flight hours and converted it to this plush executive aircraft. Inset shows interior. Conversion job proved an invaluable experience to the company charged with the customizing of new Grumman Gulfstream turboprops, for which it is distributor.

when you're high, use OXYGEN

Why and when you should use that mask — a simply written report on a technical subject.

By ARTHUR E. MILLER

Director of Research, Scott Aviation Corp.

FROM BIRTH until death, we breathe air. It was only about 165 years ago that scientists discovered that the prime purpose of breathing is to obtain the oxygen our body needs, and to get rid of the excess carbon dioxide produced by the body.

The human body is a heat engine which consumes fuel (the carbohydrates, fats, and proteins derived from the food which we consume) and by a process of combustion or oxidation converts this fuel into the energy we need to live.

The average human being at rest generates about the same amount of heat as a 70-watt electric bulb. At the same time he is consuming a certain amount of oxygen.

Resting, he will consume approximately one-half pint of oxygen per minute. Walking, working or running, he will generate more heat and consume progressively more oxygen. At extremely severe exertion, he may consume as much as eight pints or one gallon of oxygen per minute.

The oxygen which our bodies need is extracted from the air we breathe. Air consists of approximately one-fifth oxygen and four-fifths nitrogen. The nitrogen is of no use to the human body; it is only a diluent and a solvent for the oxygen which we need.

In order to obtain the one-half pint of oxygen per minute consumed by a resting man, the body will take in and expel a total of approximately 12½ pints or 1½ gallons of air per minute. At severe exertion, the eight pints per minute of oxygen the body requires is obtained by breathing a total of 180 pints or 22½ gallons of air per minute.

Our bodies are equipped with a respiratory system (lungs) and a circulatory system (heart, arteries, veins and capillaries) to extract the oxygen we need from the air we breathe.

As long as we remain at or near sea level, we have no need for additional oxygen above that contained in the air we breathe unless something impairs the ability of our respiratory and circulatory system to function properly. Then we need therapeutic oxygen either by mask or by oxygen tent.

But when we ascend in altitude there is a change in the air which we are breathing which makes it necessary to supplement the oxygen in the air by adding oxygen to it. Otherwise we suffer symptoms of "hypoxia", which means simply a reduction in the amount of oxygen available to the body. If the hypoxia becomes severe enough, it can result in "anoxia", which is a near-total lack of oxygen in the body tissues.

The first symptoms of oxygen deficiency will usually be noticed between 10,000 and 12,000 feet. (A few individuals may begin to notice some of these symptoms at altitudes as low as 5,000 feet, but these individuals are in the minority.) Initially you feel drowsy and languid; you don't think very lucidly, you don't see your aircraft instruments very clearly.

The coordination between your mind, hands, and feet begins to be impaired; you are a bit clumsy and inefficient but you yourself probably will not be aware of it. You may begin to feel a dull headache, but again you may be only half aware of it. The condition continues to become more aggravated and severe the longer you stay up there, or if you climb higher. At 15,000 you experience the same giggly, giddy symptoms as one who has had a few too many cocktails. Your heartbeat is accentuated, your lips and fingernail roots begin to turn blue, your eyes are blurred. But you feel j-u-s-t f-i-n-e! In fact, you may be hilariously happy—"euphoric" is a technical name for this condition.

Nothing bothers you, and you are quite confident that you are doing a better job of flying than you have ever done before. You are in about the same condition as the chap who insists on driving (*Continued on page* 70)

Frederick B. Ayer with a Convair 240 which his company has converted from a one-time commercial airliner to a custom-styled executive Ayer-Liner.

Like a modern Horatio Alger, this youthful master salesman is a key man in the gigantic used aircraft shuffle as airlines change from piston to jet power.

The AYER story

By RICHARD HAMMER

AS MAJOR AIRLINES phase out their far from work-weary fleets of piston-engine aircraft to make way for jets and turboprops, the used aircraft market starts a re-shuffling operation which can and no doubt will change the entire airline and business aircraft fleet structure throughout the world. Key man in this gigantic shuffle is a 31-year-old master salesman, Frederick B. Ayer.

First indication that Ayer held trump cards in the deal came last year when C. R. Smith, president of American Airlines and long noted in the industry for hardheaded and successful financial operations, announced that Frederick B. Ayer & Associates, Inc., had contracted to purchase 24 of American's fleet of Convair 240s, a deal valued by Ayer at $6 million and biggest of its kind in airline history.

Two months later, Ayer had six more of American's Convair 240s. Then he bought two Douglas DC-6s from Continental Airlines and three Convair 440s. And finally, in April this year, he signed a purchase agreement with American for 45 Douglas DC-6s valued at $30 million.

Ayer's total fleet purchase commitment to date: 80 aircraft including 47 DC-6 series, 30 Convair 240s and three Convair 440s—for a total value of $40,500,000.

Important point to be noted in the entire transaction is that Ayer has contracted to *purchase* this 80-plane fleet, not just act as broker or middle man. He intends, of course, to re-sell or lease them to airlines and corporate users throughout the world. To date, only 18 of the planes have been delivered as the airlines slowly receive their new jets and turboprops. And as of the first of August, Ayer has sold or leased 15, while one of the remaining three Convairs had been converted as an executive aircraft demonstrator for Ayer salesmen.

Sales price set by Ayer on the DC-6s ranges from $575,000 for a 54-passenger model to $875,000 for a DC-6A all-cargo version. The Convair 240s are being offered with 40-passenger airline configuration at $250,000, while the corporate version, completely modified for long range executive use, is sold at $385,000. The Convair 440s, larger and later model of the 240, are being marketed to airlines at $550,000 or, fully converted as executive carriers, they go to corporations at $650,000.

Working with Ayer in production of custom-styled conversions known as "Executive Ayer-Liners" for the corporate fleet is long-time conversion specialist AiResearch Aviation Service Company, a division of the Garrett Corporation. In its large plant at Los Angeles International Airport, AiResearch engineers convert a plane like a Convair 240 to meet a customer's specifications, from overhauling and reconditioning to restyling of the interior.

While observers of the aviation scene speculated on where Ayer had gotten or would get the money to back up his by now history-making deals, grass was not growing under his feet. On June 5, the American Express Company announced that it had extended to Frederick B. Ayer & Associates a long-term subordinated line of credit which could be drawn upon as required for the firm's world-wide resale and leasing program. In a nutshell, this meant that Ayer would be in a position to solve the many and intricate financial problems presented by buyers or lessors of his firm's planes, wherever they might be throughout the world.

Now there was nothing left for observers to do but go back and try to piece together the steps by which Ayer, a modern Horatio Alger if ever they'd seen one, had achieved his position of prominence—all 40 and a half million dollars worth of it—at the head of the aircraft market.

Ayer first displayed the tenacity, which later would see him through many a tough situation, when he graduated from Choate School, one of the nation's top preparatory academies, at 16—despite the fact that his junior year was spent with a private tutor because of a leg ailment, several unsuccessful operations and prolonged hospitalization. His experience with the medical profession convinced him that this should be his future and that fall entered Harvard as a pre-med student.

After two semesters of college life, however, he decided that education in the formal sense was not for him. That summer, refusing help from his family, he supported himself as a short order cook, net operator on a Gulf coast shrimp boat, and anything else he could find to do. One summer of this and Harvard didn't seem so bad after all. But another year in Cambridge and once again he struck out for himself—this time in an Ercoupe bought with borrowed money.

Flying up and down the eastern seaboard, he discovered at one field after another that there was money in used planes. Looking around, he found a Culver V for sale; searching further he found a buyer willing to pay $150 more than the seller was asking—and he was in business as an airplane broker. That was 1946 and Fred Ayer was 18.

By mid-1947, he had set up a one-man brokerage at Teterboro Airport in New Jersey—total capital, $600. Within a few months he moved his office to Princeton, adding five years to his age so his (*Continued on page* 118)

THE PRO'S NEST

You can extend the range of your airplane and save fuel as well by properly leaning out the mixture when above 5,000 feet mean sea level.

By TED DUROSKO

FUEL ECONOMY

THE CLEVELAND PHYSICIAN beamed as he pushed his 182 into the hangar near mine at Cleveland-Hopkins. "Flew the 400 miles from New York City at 8,500 feet and had a wonderfully smooth ride above the summer afternoon turbulence," he commented.

"Did you lean out the mixture for more economy when at 8,500?" I queried.

"No, I didn't." The medical man stopped pushing on the nosewheel bar. "You know, that mixture control perplexes me. On one trip I pulled it out a little bit and nothing happened. On another day I pulled it out about three inches and the engine just about quit. So now I just don't bother with it."

Doc's experience with the mixture control is similar to others. As a result they do not bother to lean when above 5,000 feet, and although the rich mixture does no harm as such, the pilots are missing a good chance to reduce the fuel rate per hour and to extend the range of the airplane —perhaps enough to safely eliminate a fuel stop.

On one of my cross-country flights, I planned to fly a Cessna 182 to a small town on the southeastern coast of South Carolina. The mileage was 725 miles. As the maximum range (no reserve) of the 182 is 700 miles at 71 per cent power at lower altitudes, this meant that it would be necessary to make a fuel stop en route. Statistics for the flight at 150 mph cruise would be 04:50 plus another 00:45 for a fuel stop, or a total elapsed time of 05:35. Fuel burned at 12 gph would be 58 gallons. At $.38 per gallon, fuel cost would be $22.04.

But flying the same route, climbing to 9,500 feet and leaning out, the range of the 182 at 56 per cent with a true airspeed of 148 mph is about 830 miles. So the fuel stop could be eliminated. Statistics turned out to be: flight time for the 725 miles (including climb to altitude) was 04:55 as the ground speed averaged out coincidentally to 148 mph; fuel burned at 8.5 gph was almost 42 gallons. at $.38 per gallon, the fuel cost was $15.96.

By comparison then, I saved 00:40 of time and 16 gallons of fuel, or a direct savings of $6.08 on that leg.

With most powerplants in today's airplanes, the manufacturer usually recommends leaning above 5,000 feet. One or two say it is permissible to start at 3,000 feet. If you are interested in leaning the mixture, first consult the handbook of the particular aircraft being flown to see what minimum altitude is advised.

Another point in favor of flying at higher altitudes is that nearly the normal cruising speed can be maintained at much less power. This means savings in fuel consumption and engine wear. Remember though, when flying above 10,000 feet, be sure to use oxygen.

Now, let us look at the technique of leaning as there is more to understanding the principle than just pulling on the mixture control. In brief, the five major factors, from the pilot's view, which affect fuel consumption are:

• *Engine rpm*: The faster an engine turns, the more fuel it uses, all other things being the same. This is explained by the term, "cubic displacement" which is the volume swept in by each cylinder during the intake stroke multiplied by the number of cylinders. So if we double the speed of the engine, the engine will sweep in twice as much volume per minute, and the fuel consumption will be twice as great. It then amounts generally to a direct proportion between engine speed and fuel consumption.

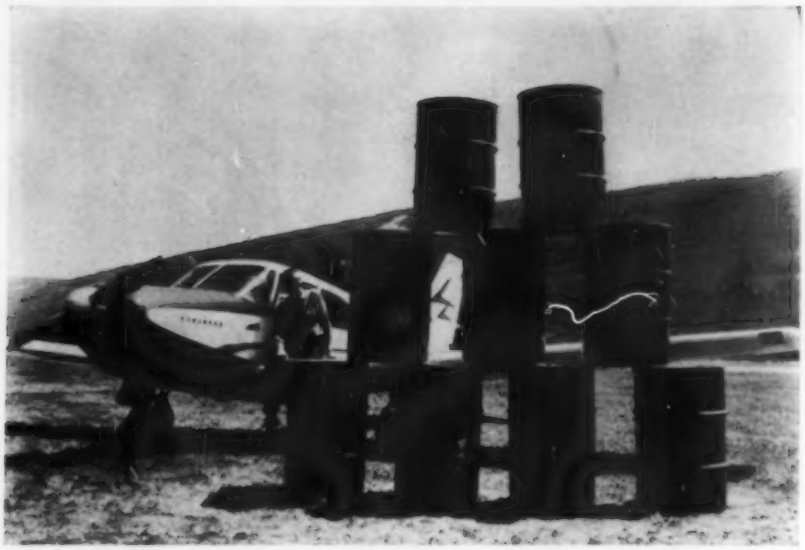
Included in operating handbooks of the later type of lightplanes, are fuel consumption charts for a given engine speed, manifold pressure, altitude and condition of fuel-air mixture. With such a basic chart, it then is an easy matter to run some in-flight checks and know exactly what the engine burns at different power settings.

Manifold pressure: This is the pressure of the air-fuel mixture which enters the cylinders, and if other factors are not changed, fuel consumption is also directly proportional to manifold pressure.

Upon opening the throttle, more air and gasoline vapor goes into the manifold and the pressure goes up. A closed throttle causes a partial vacuum in the manifold, giving a low reading on the manifold pressure gauge.

The manifold pressure that can be realized at full throttle depends upon the atmospheric pressure existing at the altitude where the aircraft is flying. This works out to about one inch less than indicated by the standard atmosphere table.

For example, at sea level with wide open throttle, a pilot can expect 29 inches of manifold pressure; at 2,000 feet, about 27 inches; at 5,000 feet, slightly less than 24 inches; 12,000 feet, about 18 inches; and at 15,000 feet, somewhere near 15 inches. Also a pilot will find that to get 21 inches at 8,000 feet, will require the throttle to be open much further than it would to get 21 inches of manifold pressure at sea level. (*Continued on page* 92)



Conrad's record-setting Comanche carried more fuel than contained in nine 55-gallon gas drums.

MAX CONRAD, MASTER of FUEL ECONOMY

THE REMARKABLE long distance record flight of Max Conrad in a single-engine Piper Comanche 250 from Casablanca, Africa, to Los Angeles, Calif., would not have been possible but for the superb fuel management exercised by Max.

Officially recognized distance of the non-stop flight was 7,683 miles as measured by Great Circle distance between the points of take-off and landing in accordance with FAI rules, actually, Conrad covered approximately 8,300 miles. The discrepancy is due to some four hours lost in "stooging" around the Gulf of Mexico area while waiting for violent thunderstorms, which were in his path, to dissipate. The flight time for the entire trip was 58 hours and 38 minutes, averaging out at 131.1 mph for the 7,683 miles. Conrad's Comanche had a total fuel capacity of 520 gallons, 60 of which are the plane's normal fuel supply, carried in two 30-gallon wing tanks, the remainder was distributed between six special cabin tanks, one of which served as his seat. Upon landing in Los Angeles, he still had one wing tank full, having consumed approximately 485 gallons, or an average of 8.02 gallons per hour.

This is one of the most remarkable achievements of the flight. Normal fuel consumption of the Comanche's Lycoming 0-540 engine is 14 gallons per hour at cruise setting of 75 per cent power. For the first eight hours the overloaded plane consumed an average of 13 gallons per hour. Gradually, as the fuel was burned off and the weight lessened, Conrad throttled down to reduce his air speed from 130 mph indicated during the Casablanca-Trinidad leg, to 100 mph toward the end of the flight. This means that, somewhere along the course, his engine developed less than 40 per cent power, with fuel consumption dropping below seven gallons per hour. That is fuel and engine management supreme, requiring from the pilot a very thorough understanding of powerplants and aerodynamics. Internal combustion engines are not fond of operating at low rpm for prolonged periods, as they tend to run cold with the result that combustion is incomplete and fouling of spark plugs is certain to occur. This was not the case with Conrad. His engine and plugs were clean and free of carbon deposits. He accomplished it by keeping his engine hot, having removed the oil radiator prior to start, and leaning the mixture. The needle of the oil temperature gauge stayed just on the edge of the red line during the flight, a procedure which would give an ordinary pilot heart failure. Re-

At San Francisco, four of Max' ten children beamed proudly at their famous father, upon completion of his record-breaking flight. From left to right, the children are: Francesco, 10; Anne, 7½; Molly, 21; and Christine, 15.

moval of the oil radiator also eliminated the plumbing, a source of frequent oil leaks.

Conrad flew low, especially during the first stage of his record flight, as climbing to higher altitude would have entailed using considerable power and thus more gallons per hour. For nine hours he never flew higher than 300 feet, on occasions getting so low that sea spray spattered the windshield.

Keeping engine temperature up and flying low was only part of fuel preservation. Conrad had to exercise extremely delicate throttle-mixture adjustment in fine coordination with propeller pitch control and airplane attitude. To his advantage, the Comanche trimmed out perfectly despite its unconventional loading, requiring a minimum of tab adjustment during the entire flight.

Comanche 110LF (for Let's Fly) was not a special aircraft built for establishing records. It was a stock airplane with a stock engine. It only differed from other Comanches in that Max removed from it everything he considered superfluous to lighten it for the monumental fuel load it was to carry. In addition to the oil radiator, the engine starter was taken off, a lighter generator installed, seats and floorboards removed and all external drag producing items, such as cowl latches, handles, etc., eliminated. The plane's weight at take-off was 5,000 pounds, 2,200 pounds more than the gross weight of a stock Comanche. Despite this, it broke ground after a 4,000-foot run over a very rough runway and climbed out at 500 feet per minute.

The flight was far from being an easy one. Conrad encountered severe turbulence, poor visibility, thunderstorms and in addition a mild form of food poisoning having drunk tea which turned rancid in his thermos bottle.

In the annals of aviation history, this flight of Max Conrad will always stand out as one of the great accomplishments of man. This record will remain unbeaten for many years. END

Skimming the desert at about 100 feet, near El Paso, Tex., his original destination, Conrad advised he had ample fuel to proceed on to Los Angeles.

LITTLE WONDER...

16,000

ADF-12's HAVE BEEN SOLD

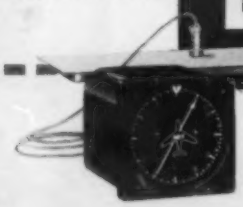
Only Lear has all 4

1. Continuous tuning, 190 to 1750 kc.
2. Only ADF with loudspeaker output.
3. Combination ADF, communication and range reception.
4. Provides power and modulation for VHF transmitter.

LEAR

LEARCAL DIVISION 3171 SOUTH BUNDY DRIVE SANTA MONICA, CALIFORNIA

LC-66



NEW LEAR-GONIO
FLA-100
ANTENNA SYSTEM

ATTENTION ADF OWNERS!

Get improved performance — greater reliability — with Lear's new non-rotatable ADF loop — seals out trouble for life. See your Lear dealer or write for brochure.

Southern California's huge aircraft-missile contractors operate a mixed fleet of light aircraft to accomplish a variety of missions.

By L. C. PENNYPACKER

SMALL PLANES AND BIG JOBS

THE REAL MEANING of business aircraft utility is clearly defined by the sprawling defense aircraft-missile industry in Southern California. The nation's top priority defense programs are centered here where major contractors and vital test centers press forward in the gigantic effort to protect our nation and the free world. With development, testing and production time at a premium, the big defense plants have learned to rely on the utility airplane to get engineers, test pilots, key executives and emergency parts and equipment throughout the complex in a fraction of the time previously spent when only surface transportation was available.

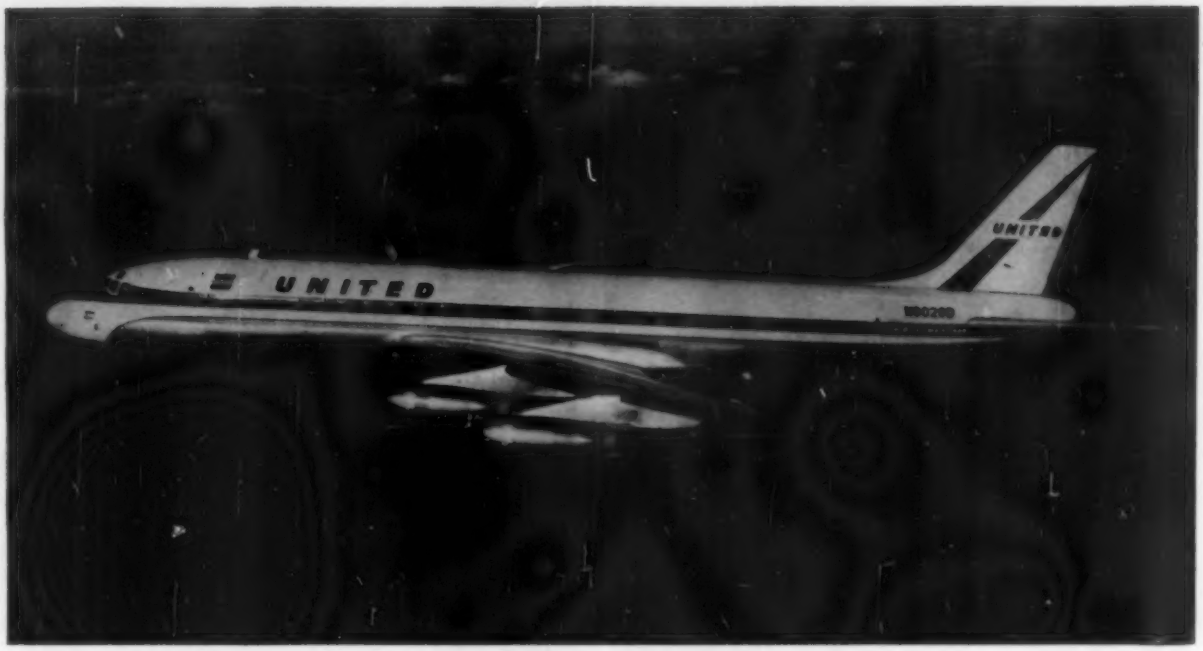
The flight departments operate mixed fleets so every demand can be met with proper equipment. DC-3s are supplemented by high-performance light twins and some single engine equipment for interplant travel and transport to the key test centers in the Mojave Desert complex and the Pacific Missile Range.

Douglas Aircraft Company owns three Aero Commanders, two Navions and a Bell helicopter. In addition, it uses a contract service for its Green Hornet line—regularly scheduled DC-3 service to Edwards AFB, Palmdale and Vandenberg AFB. The helicopter is on dawn-to-dusk alert for air-sea rescue, for its own test pilots and other emergencies. The Aero Commanders are used to ferry key personnel and parts to outlying plants, vendors and special trips to test centers off the regularly scheduled routes.

One of the Navions is stationed in the desert and is used to chase and find equipment used during aircraft and missile tests, recovering parts and so forth. The Aero Commanders—each averages 60 hours per month—make frequent flights to vendors in Sacramento, Pomona, Orange County; and intraplant trips to Long Beach and El Segundo. Test pilots and engineers make frequent trips to Palmdale, Edwards AFB, and Vandenberg as urgently needed on the spot.

Lockheed's California division (*Continued on page 80*)

Group of Douglas engineers wait for interplant plane transportation.



United Introduces DC-8 Jet Service

United Air Lines will be among the first to inaugurate scheduled transcontinental DC-8 jet service. The new Douglas DC-8's in United's fleet will accommodate 113 passengers with a mail and cargo capacity of 12,000 pounds. Cruising speed is 575-600 m.p.h. To date, United has 40 DC-8's on order.

Pratt & Whitney JT-3's (13,000 pounds thrust) will power 22 of the 40 DC-8's ordered. The remaining 18 will be equipped with the more powerful JT-4 (15,900 pounds thrust). The JT-3 (or J-57 as the military version is called) is the western world's primary jet-turbine engine. Since full-scale production in 1953, more than 14,500 of these engines have logged nearly 3 million hours. A first cousin of the proven JT-3, the more powerful JT-4 (J-75) has an established performance record on advanced Air Force fighters.

There are some interesting statistics on United's DC-8's. For example, each plane can account for upwards of 71,000 passenger miles per hour. Douglas engineers, technicians and flight crews ran up more than 3 million man-hours in testing the DC-8. During the air line certification tests on the JT-3 and JT-4, engine performance withstood rigorous tests far above operating requirements.

Jet age lounge of United's DC-8 jet Mainliner has generous dimensions and smart decor. Cabin pressure is maintained at sea level up to 23,000 feet; at 40,000 feet, pressure compares to 6,700 feet.

Phillips Petroleum Company, a supplier of aviation gasoline and jet fuel for United, salutes this important jet age achievement.

● A pioneer in the development of aviation fuels, Phillips Petroleum Company is a leading supplier of high octane gasoline, super-performance jet fuels, and aircraft lubricating oils for commercial, private, and military aircraft. And Phillips research continues to lead the way, developing new fuels and lubricants for the aircraft of tomorrow.

AVIATION DIVISION • PHILLIPS PETROLEUM COMPANY • BARTLESVILLE, OKLAHOMA

Anyone who is contemplating the purchase of an airplane, or planning to lend money on one, should be sure to

Clear that title!

By KENDALL K. HOYT

WHEN AN AIRCRAFT changes hands, it is wise for the buyer or money lender to check the FAA records or have a title company do it. For each aircraft, large or small, there is a file in Washington to record all changes in ownership, mortgages, airworthiness inspections, and major overhauls or alterations. Here are a few notes on how that file may be useful to the owner and especially to anyone who buys the plane or lends money on it.

The system works with a minimum of fuss and paper work. When an aircraft is first sold, FAA is notified by as well-devised a form as any government agency ever invented. It includes the bill of sale and the registration certificate. A yellow duplicate is attached for the buyer to keep in the cockpit as temporary evidence of ownership until FAA returns the stamped certificate.

If you lose the registration or the airworthiness certificate, required in the aircraft at all times, FAA will send a new one at $1 each. Write to Robert E. Forbes, Chief, Aircraft & Airman Records Branch, Federal Aviation Agency, Washington 25, D. C. Or call at 916 G St., N. W., on the fifth floor.

Beyond this, the small staff that operates a building full of files cannot search yours for information. You must do it yourself or employ a Washington aircraft title company.

The aircraft records are indexed by N-number with a cross-reference alphabetically by owners' names. You can examine the folder for your plane or any other, to copy anything you like. FAA will photostat any page for 50 cents.

When you buy an aircraft, FAA will not approve the registration unless the bill of sale is from the last owner of record. When a plane changes hands rapidly, the paper work may fall behind. A bill of sale from John Jones will be unacceptable if the plane is still registered as owned by George Smith. FAA must be sent a bill of sale from Smith to Jones.

All sales must be notarized. If a partnership is selling, either partner may sign. But in a case of co-ownership, both owners must execute the transfer.

FAA is fussy about names. A man named Robert, as he was identified in the registration, signed as "Bob" in a bill of sale. To make it legal, he had to file a bill from Robert to Bob, though protesting that he was one and the same.

As soon as an aircraft is sold, the previous registration becomes invalid. Until the new (*Continued on page* 84)

FORM ACA-500 (PART A) (3-56)

UNITED STATES OF AMERICA
DEPARTMENT OF COMMERCE — CIVIL AERONAUTICS ADMINISTRATION
CERTIFICATE OF REGISTRATION

NATIONALITY AND REGISTRATION MARKS	AIRCRAFT SERIAL NO.
N— 00xyz	0000

NAME OF OWNER: Joe Smith
ADDRESS OF OWNER (NUMBER AND STREET): 9900 Alpha Street
CITY: Arlington, Virginia
STATE

It is hereby certified that the above described aircraft has been duly entered on the register of the Civil Aeronautics Administration, Department of Commerce, United States of America, in accordance with the Convention on International Civil Aviation of December 1944, and with the Civil Aeronautics Act of 1938, as amended, and the rules and regulations thereunder.

DATE OF ISSUE:

FOR THE ADMINISTRATOR OF CIVIL AERONAUTICS

Forward This Copy and the Duplicate Copy to Washington. (OVER)

FORM ACA-500 (PART B) (3-56) Form Approved Budget Bureau No. 41-R069.4

U. S. DEPARTMENT OF COMMERCE — CIVIL AERONAUTICS ADMINISTRATION
APPLICATION FOR REGISTRATION

NAME AND ADDRESS OF APPLICANT (*Same as that shown on Part A of this form*): Joe Smith

REGISTRATION NO.: N— 00xyz

AIRCRAFT MAKE AND MODEL:

SERIAL NO.:

CHECK WHETHER OWNERSHIP IS: ☐ CORPORATION ☐ PARTNERSHIP ☐ CO-OWNERSHIP ☒ INDIVIDUAL OWNER

I HEREBY CERTIFY that the above described aircraft is not registered under the laws of any foreign country; that the owner whose name(s) appear hereon as the applicant is (are) a citizen of the United States as defined in Section 1 (13) of the Civil Aeronautics Act of 1938; and that both copies of Part A and a copy of Part B of Form ACA-500 and legal evidence of ownership were forwarded to the Civil Aeronautics Administration, Washington, D. C.

SIGNATURE OF APPLICANT (*In ink*): Joe Smith (*If executed for co-ownership, all must sign*)

7/2/59
DATE OF APPLICATION

TITLE

If all the above statements are true and made in good faith, the aircraft described above may be operated, pending registration or notification from the Civil Aeronautics Administration, provided airworthiness requirements of applicable Civil Air Regulations are complied with.

FORWARD THIS COPY TO WASHINGTON — Retain Duplicate Copy.

FORM ACA-500 (PART C) (3-56)

U. S. DEPARTMENT OF COMMERCE — CIVIL AERONAUTICS ADMINISTRATION
BILL OF SALE

For and in consideration of $ 1000.00 the undersigned owner of the full legal and beneficial title of the aircraft described as follows:

AIRCRAFT MAKE AND MODEL: Alpha B
SERIAL NO.: 0000
REGISTRATION MARK: 00xyz

does this 25th day of June 19 59 hereby sell, grant, transfer, and deliver all of his right, title and interest in and to such aircraft unto:

(*Name and address of purchaser—same as on Parts A and B of this form*)

and to his executors, administrators, and assigns, to have and to hold singularly the said aircraft forever, and certifies that same is not subject to any mortgage or other encumbrance except

TYPE OF ENCUMBRANCE	AMOUNT	DATE
NONE		
IN FAVOR OF		

In testimony whereof I have set my hand and seal this 25th day of June 19 59

NAME OF SELLER: Jack Jones

BY (SIGN IN INK): Jack Jones (*If executed for co-ownership, all must sign*)

TITLE: (*If signed for a corporation, partnership, owner, or agent*)

ACKNOWLEDGMENT

State of Virginia
County of X

On this 25 day of June 19 59 before me personally appeared the above named seller, to me known to be the person described in and who executed the foregoing bill of sale, and acknowledged that he executed the same as his free act and deed, and, if said bill of sale be that of a corporation sworn that he was duly authorized to execute the same. Given under my hand and official seal the day and year written above.

NOTARY PUBLIC (SEAL): A B Cer

MY COMMISSION EXPIRES: 6/6/66

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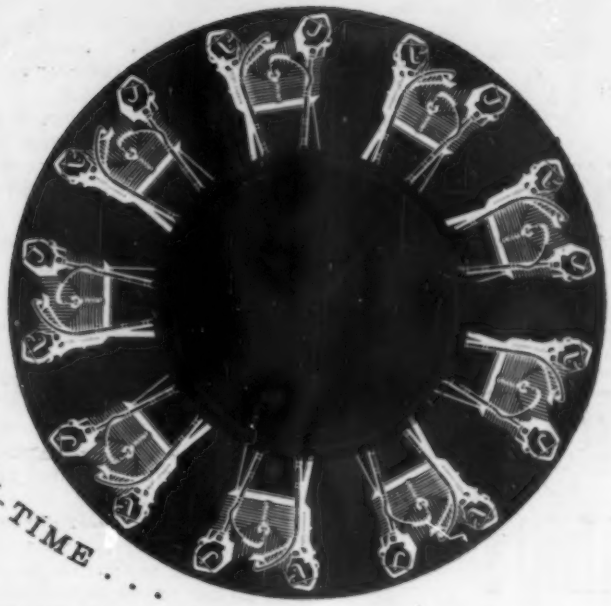
NO UNREALISTIC DOWN-TIME . . .



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SPARTAN AIRCRAFT COMPANY AVIATION SERVICE DIVISION
municipal airport / tulsa, oklahoma

SPARTAN PROMISES AND DELIVERS

NO. 236

I learned about flying from that!

First flight across the Alleghenies is a memorable experience for any pilot but when it is accompanied by violent thunderstorms, it becomes indelible!

By HANS BANNIES

SKIMMING ALONG at 500 feet, not daring to climb out with a reduction in cruising speed, I was tensely watching the Allegheny mountain range close on my left, with its peaks of 3,000 plus well above me. A thunderstorm was moving in from the right and it was just a matter of time to learn which would be faster, my little Tri-Pacer or the big black mass, which was rapidly narrowing the small gap ahead.

It all started out so pleasantly the day before, on a business trip to Tri-City Airport in Tennessee, taking off from New Holland Airport in Pennsylvania on a heading of 240 degrees and climbing to my intended altitude of 7,000 feet in a clear blue sky. Crossing the Susquehanna River, with its winding bed engraved in the green hills, I reported my departure time to Harrisburg State Airport. The weather was balmy, with a headwind of only six to eight miles. Estimating Tri-City in four hours, I tuned in Westminster OMNI and passed over the station after 40 minutes.

A few high clouds sailed above at about 10,000 feet, and I really felt fine, separated from highways, dust and traffic lights. After the needle swung over, I corrected my heading to 225 and calculated that the planned fuel stop in Charlottesville would be due in 68 minutes. Check points rolled by like a colorful carpet spread out down below, right on schedule. Even without an OMNI receiver, it would have been strictly routine and, 60 minutes later, I started my let-down to Charlottesville to refuel. This precaution should bring me well into Tri-City Airport with plenty of fuel left.

Back at 7,000 feet with full tanks, I tuned in Gordonsville OMNI and took a new heading of 255 degrees toward Roanoke, which was supposed to appear 65 minutes later. Until then the terrain had been level but, with a course gradually intercepting the mountains, I began looking forward to the experience of flying over rugged country. It sure turned out to be one!

I assumed that everything would be just as it was over the flat country. With more than 20 hours instrument training under the hood and in the Link, I felt pretty safe in the air. So, with such thoughts in mind, I crossed the first larger range at 8,000, leaving plenty of space between those respectable 4,000-foot peaks which were gradually rising in my path. The weather report was still favorable and a direct approach seemed in order. After all, an OMNI range station was located right at the airport, according to the map.

Just then I crossed another of those long, blue-green ridges, with the intention of following a valley to keep clear of the mountains during let-down. Coming over a ridge, low clouds shifted below in the valley, spoiling my original plans, and all self-confidence went overboard with it.

In descending, I lost the distant Pulaski OMNI and tried to get the nearer Tri-City station. No luck. Holding my heading, I tried continuously with growing concern, after getting closer and closer without any signal. Not a beep. I finally occupied myself with this task, with my nose more in than out of the cockpit, and forgot all about checking landmarks, while the plane moved on mile after mile. I was well on my way to getting lost in a mountain valley, and practically on approach.

Then I got the bright idea of switching to the LF-range, and to study the landscape below, which did not look quite so beautiful any more. Fortunately, there was plenty of gas in the tanks. Heading west, I crossed a river and turned back to the LF range station, finally intercepting the beam and finding landmarks simultaneously. Soon the airport runway gleamed up ahead. How pretty it looked! After calling the tower and closing my flight plan, I touched down on the runway. With a sigh of relief, I climbed out of the seat, stretching my numb legs.

It seemed very hot in Tennessee, or was it? You see, it was not too pleasant to get lost above the mountains while attempting to tune in an OMNI station which was under repair and closed down for a few days! From now on I consult the Airman's Guide before each cross-country.

The return trip was scheduled for noon next day. The sky had become somewhat cloudy by this time and big cumulus sailed by. It was really quite warm with a chance of thunderstorms. So, to remove doubts, I checked weather. The information was not too encouraging. Some thunderheads were around alright and it was expected that by mid-afternoon the spearheads would reach Tennessee. My flight path lay right into the weather, which was moving in from northeast and an immediate take-off seemed in order. By staying below the cloud base of 8,000 feet, I could cross the Blue Ridge easily to the open country well before the storms caught up with me.

Following the weatherman's good advice, and after carefully checking en-route stations in the Airman's Guide, I rumbled down the runway and was up again. After reaching cruising altitude at 6,000, the billowing clouds with their soggy bellies were still well above me. All was well and the weather just as predicted. However, one hour later and still over the Alleghenies, I found myself flying erratic courses, (*Continued on page* 117)

". . . and the Super 18's cockpit is just as private as an airliner's."

Executive Pilots: Fly the new Super 18 . . .

America's only long-range executive twin with all 6 of these airliner features:

Many executive pilots consider taking command of the 1959 Beechcraft Super 18 the most thrilling flying experience of their careers. And this month, your Beechcraft distributor or dealer invites you to take up the Super 18 and share their adventure.

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1. Powerful 450 hp Pratt & Whitney airliner-type radial engines let you cruise easily at 215 mph and deliver 234 mph top speed. Low rpm operation means extra dependability and longer trouble-free service.

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3. Longer range. The Super 18 can fly coast to coast with just one fuel stop.

4. Separate pilot compartment with large, tension-easing, airliner-type seats.

5. Panoramic pilot visibility, with overhead cockpit windows and broad "picture window" windshield.

6. Spacious passenger lounge in which your firm's top men feel at ease. Private lavatory, food bar, office-aloft equipment and lots of 'walk around' room.

So remember to schedule your flight in the Super 18 soon. And when you talk to your Beechcraft distributor or dealer ask about low-cost Beech financing and leasing plans. Or write: Public Relations Dept., Beech Aircraft Corporation, Wichita 1, Kansas, U. S. A.

SUPER 18 TWIN-BONANZA BONANZA TRAVEL AIR MS 760 JET

Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Oxygen

(Continued from page 57)

his car home after a New Year's Eve party when he is scarcely able to walk.

At 20,000 feet you are really in trouble. Your vision is so blurred and foggy that you can scarcely see your instruments, much less read them. You can barely hear your engine. Your breathing is labored, panting; your heart is pounding away at a terrific pace. Your judgment and perception, and realization of your own condition, is about as sharp and as intelligent as that of a five-year-old idiot. You haven't the faintest idea that anything is wrong, much less what is wrong, and you don't care very much. About the only thing you want to do is sleep.

At 25,000 feet you collapse, and will probably be dead for lack of oxygen (anoxia) in a half hour or less. Or, you'll probably spin out of control while unconscious and you're not likely to recover consciousness in time to pull out.

So you see, the effects of hypoxia are very definite. They may vary from one individual to another, but there are no supermen. Everyone needs oxygen, and while a few abnormal individuals may be able to tolerate a few more thousand feet of altitude than the average individual, don't gamble on the fact that you might be one of them.

There are just as many subnormal individuals who begin to suffer (though they themselves are not aware of it) from oxygen lack at altitudes as low as 7,500 or even 5,000 feet.

Remember, too, that alcohol and oxygen-lack work hand in hand. A few drinks may make you feel just fine; so does lack of oxygen. The two together are more potent than either one alone.

Also, if you are a heavy smoker, the ability of your blood to carry oxygen to your body tissues may be mildly impaired by the steady diet of carbon monoxide from the tobacco smoke. This, too, can greatly accentuate the effects of oxygen deprivation.

Go easy on aspirin or any drugs containing coal-tar derivatives, as well as sulpha drugs. If you are taking any of these on doctor's orders, fly as a passenger but not as a pilot. The same applies to most of the hay fever and airsickness remedies, tranquilizers, etc. Any of these can intensify the effects of oxygen lack.

Don't believe the theory that by breathing faster and deeper you can compensate for oxygen lack. Abnormal breathing, known as "hyperventilation," does not help to offset lack of oxygen. It merely causes you to flush out of your lungs and blood much of the carbon dioxide which your system needs to maintain the proper degree of blood acidity. This in itself can cause you to become lightheaded or even to collapse. *Breathe normally.*

Don't be misled by the tall tales you might hear from the chap who says he regularly flies at 18,000 feet without oxygen and feels and does just fine. He *might* have done it once or twice, but he only *thought* he was doing and feeling fine, and he was just lucky enough to get away with it. If he keeps it up, he'll die—but not of old age.

And don't be confused by the stories about the South American Indians who live in the Andes at 18,000 feet and work there without supplementary oxygen. Those Indians were born there, the offspring of many, many generations of Indians who have been born and lived there all their lives. Their body processes, their respiratory and circulatory systems, are different from yours.

It's true that people who live at high altitudes can tolerate low oxygen concentrations, but only a very small percentage of the population lives at altitudes above 5,000 feet; therefore what is said here applies to the vast majority of individuals.

The only safe course is to have oxygen equipment available, and to use it whenever you are flying above 5,000 feet. This, of course, relates to private pilots and is not applicable to passenger transports which are pressurized up to 8,000 feet or more. It is true that the average individual doesn't need it until he gets up around 10,000 feet but, unless you have a thorough medical examination and have undergone tests to prove your ability to withstand oxygen deficiency, play it safe.

NEXT MONTH IN FLYING

★

AIRCRAFT OF THE FUTURE

A leading government research expert outlines big changes ahead in manned aircraft design.

★

CONVAIR'S NEW JET 880

Cover photo and special report on first delivery model to TWA.

★

AIRBORNE PENMANSHIP

Story of Parker Pen Co.'s long and successful use of business flying.

Don't try to decide for yourself whether or not you need it. The first parts of the body to be affected by oxygen lack are the eyes, the cells of the brain, and the nervous system. You are totally incapable of judging for yourself whether or not (or when) you need additional oxygen.

Incidentally, the retina of the eye is especially susceptible to even a slight lack of oxygen. Therefore, when night flying, or flying in poor light, it is more desirable to use oxygen from the ground on up, and to keep using it until you are back on the ground.

Air at ground level contains plenty of oxygen for our bodily needs; the average individual can get enough oxygen out of the air at altitudes as high as 10,000 feet. Air is a mixture of oxygen and nitrogen. Dry air at ground level contains 21 per cent oxygen by volume, which means that of every gallon of air that we breathe, 0.21 gallon or 1⅔ pints is oxygen; the remainder is nitrogen. Oxygen is approximately 14 per cent heavier than nitrogen. So, although by volume the oxygen in air represents 21 per cent, if we were to extract the oxygen from a gallon of air we would find that the oxygen represents 23 per cent of the weight of the gallon of air.

A gallon of air at sea level at a normal temperature (70°F.) weighs 0.16 ounce. Twenty-three per cent of this weight is oxygen, so that in every gallon of air we breathe there is 0.0368 ounce of oxygen. As we go up in altitude, the percentage of oxygen does not change but the atmospheric pressure decreases and the air becomes less dense.

At 10,000 feet, the gallon of air weighs only 0.011 ounce. Twenty-three per cent of this weight is still oxygen, so that in each gallon of air at 10,000 feet there is only .0253 ounce of oxygen available for our bodily needs.

If we want to maintain a "sea level equivalent," which means we breathe the same amount of oxygen that we would be getting at sea level, then at 10,000 feet we would have to add .0115 ounces of oxygen to each gallon of air that we breathe.

As we go up in altitude we'd have to increase the amount of added oxygen, and by the time we reached approximately 33,000 feet we would need to be breathing 100 per cent pure oxygen.

This supplementary oxygen can be added to the air we breathe in two different ways. One is by using an oxygen mask of the type known as the "constant-flow rebreather type." This type of mask consists of a facepiece, which fits over the nose and mouth; attached to it is a rubber or plastic bag. Oxygen is delivered from a compressed oxygen container where the oxygen is stored at high pressure (1,800 pounds per square inch), through a pressure reducing regulator, and then at a continuous flow through an orifice into the bag.

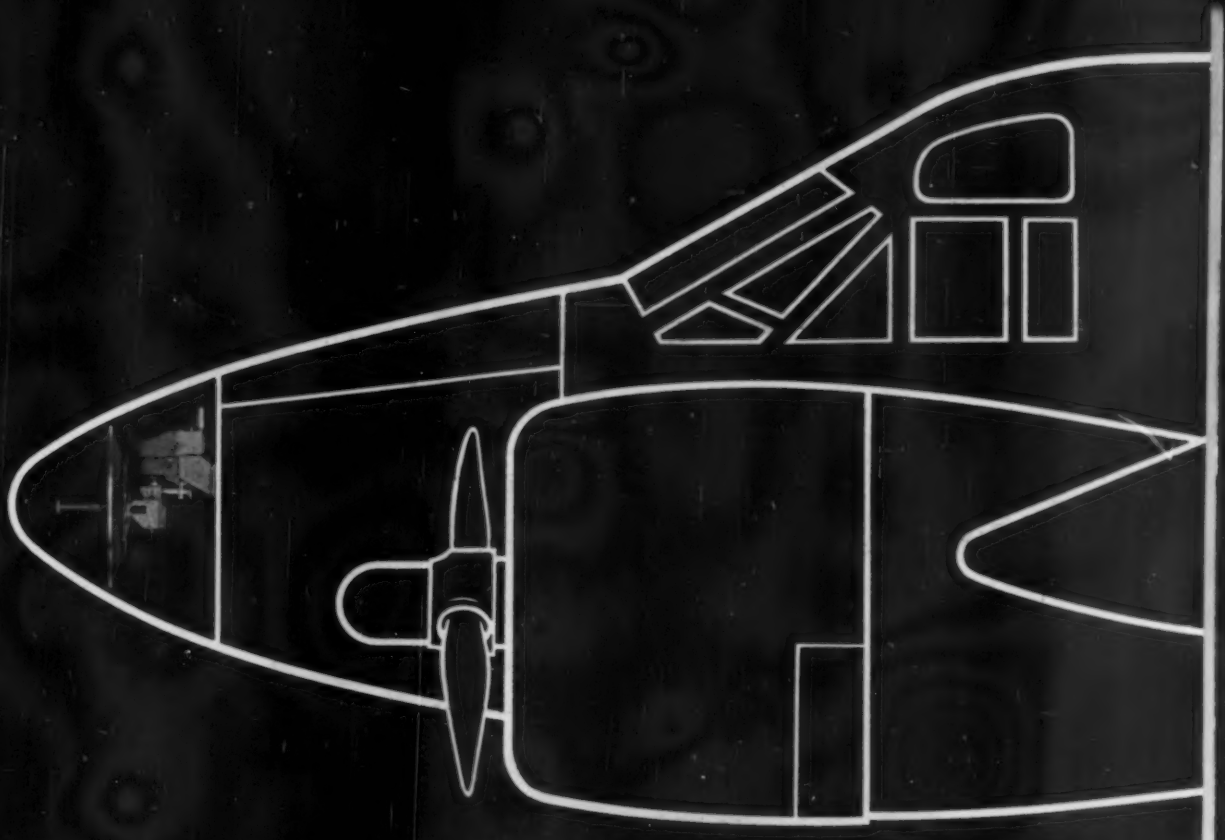
On inhalation, you first inhale the contents of the bag and, when the bag is deflated, you take in some of the surrounding air through portholes provided in the mask.

When you exhale, the first part of your exhalation goes into the bag where it mixes with the incoming oxygen. The remainder of your inhalation escapes to the surrounding air through the portholes. The rate of flow of oxygen into the bag is increased with altitude, providing an increasingly richer mixture.

This type of oxygen mask is very simple and lightweight. Because oxygen is delivered to the mask at a fixed rate of flow it is possible to calculate quite accurately how long a given supply of oxygen will last. For the private flier, this type of system is perfectly adequate for use at altitudes up to 30,000 feet.

Such a constant-flow system, in which oxygen is delivered at a constant rate, does not allow for the increased need for oxygen which would arise if an individual were exercising or under severe

(Continued on page 74)



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For further information, contact your local dealer or write Bendix Radio, Dept. 281, Baltimore 4, Maryland.

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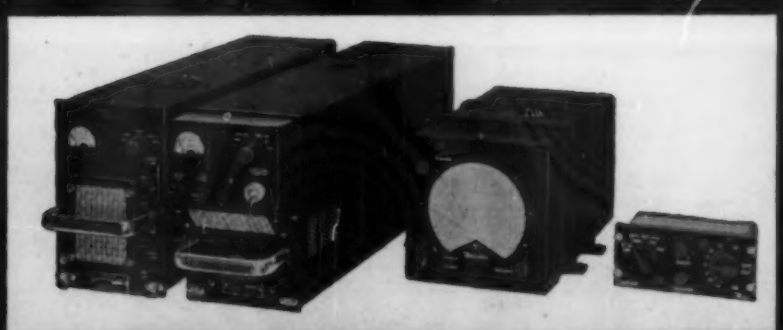

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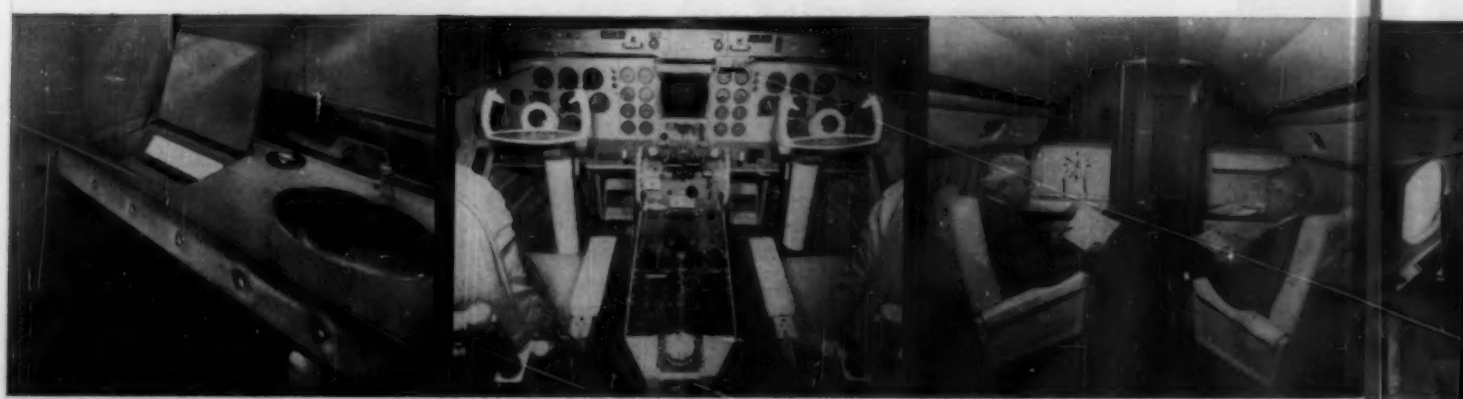

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GULFSTREAM—by Grumman .... POWER—by Rolls-Royce.
INTERIOR—by the purchaser!

The pictures show how one leading corporation has "fitted out" its Gulfstream. The point is that the Gulfstream's basic configuration enables each corporation-owner to choose the interior layout, decor and equipment that individualize the aircraft to the company's precise needs and tastes. There is no "re-doing" airplanes originally designed for other purposes.

The Gulfstream has been conceived by Grumman expressly for corporate use. It uniquely combines performance, utility, reliability and safety to make it America's No. 1 Business Aircraft—and, therefore, the logical first choice of leading corporations. It carries 10-12 passengers.

Powered by two Rolls-Royce prop-jet engines, the Gulfstream cruises at 357 mph and has a range of 2600 miles plus reserve. Pressurization at 25,000 feet provides a comfortable air-conditioned cabin altitude of 5500 feet—permitting operation above the weather and traffic. The Gulfstream's ability to get in and out of smaller airports—those with runways of approximately 4000 feet—substantially increases its utility and scope of operations.

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NEW TURBINE PLANES FOR THE BUSINESS FLEET

TWO NEW turbine-powered aircraft will be soon available for business and executive use. One is the 350-mph Allison Super Convair, shown above, a conversion of Convair 340 or 440 to Allison 501 turboprops rated at 3,750 eshp each. All conversion work is being done by PacAero Engineering Corp of Santa Monica, Calif. First Super Convair will go to Allison, the second to AC Spark Plug Division of General Motors and the third to Union Oil Co. of California.

The other plane is the new Lockheed JetStar with four Pratt & Whitney, 3,000-pound thrust JT-12 turbojets, shown below. It is expected to be ready for delivery in 1960. Incorporating a new high lift wing leading edge and thrust reversal, it will be capable of operating from small fields.

One of the first to order the 600-mph executive planes was the Ryder Systems, Inc., a large truck leasing and operating concern with offices in the United States and Canada. Another purchaser was the Canadian Department of Transport who will use it to evaluate navigational aids at high altitude and to set up traffic control for jet aircraft.

(Continued from page 70)

stress. Therefore, in military flying and in commercial transports, the crew is furnished with "diluter-demand" oxygen regulators.

These regulators automatically mix oxygen and air in different proportions in accordance with altitude. Whether the man be sitting calmly, breathing shallowly, or whether he be under stress and exertion and breathing deeply, the diluter-demand regulator delivers the right mixture of air and oxygen under all conditions.

The disadvantages of this system are that the diluter-demand regulator is bulkier, heavier, more costly (both initially and in maintenance) than a simple constant-flow regulator. Also, unless one knows in advance exactly what the pilot will be doing and how he will be breathing, it is impossible to predict accurately how much oxygen he will consume.

Therefore, it becomes necessary to carry an ample supply to be sure that he has enough to last him. This means that there is a greater weight penalty, since the more oxygen that is carried the larger and heavier the oxygen container becomes. In lightplanes this can be a serious drawback.

Now for a few words of warning about oxygen. Oxygen itself is an incombustible gas; it will not burn. However, oxygen has the peculiar property of supporting and accelerating combustion. If a burning candle is placed under a bell jar, the candle will continue to burn until it has consumed the oxygen in the air within the bell jar and then the candle goes out. There can be no fire without oxygen.

On the other hand, if a piece of cloth is ignited inside a bell jar which contains, say, 50 to 60 per cent oxygen, then the cloth burns as though it were saturated with gasoline. The high oxygen concentration accelerates the burning. For this reason, smoking should be absolutely prohibited near oxygen equipment or when an oxygen mask is being used. A spark, or a hot ember from a cigarette or a cigar, while perfectly harmless normally, could cause a disastrous fire

(Continued on page 76)

AC Sparks All Five Winners
in 1959 Powder Puff Derby

FIRST	SECOND	THIRD	FOURTH	FIFTH
Pilot: Aileen Saunders Co-pilot: Jerelyn Cassel Plane: Cessna 172	Pilot: Juanita Newell Co-pilot: Jimmye Lou Shelton Plane: Piper Comanche P-24	Pilot: Margo Callaway Co-pilot: Sandra Callaway Plane: Cessna 140	Pilot: Marian Burke Co-pilot: Evelyn Kelly Plane: Piper PA-18	Pilot: Pauline Glasson Co-pilot: Ardath McCreery Plane: Cessna 175

Lifting their planes off the runway at Lawrence, Massachusetts, the lovely and skillful ladies flew a rugged 2,470 miles westward to touch down at Seattle, Washington. Once again this great competition displayed the ability of the participants to get the most out of their planes.

Of the more than 60 planes that started the race, the first five winners were sparked by AC . . . In fact, ACs were used on 16 out of the first 20 planes.

That says a lot for the performance and reliability of AC Aircraft Spark Plugs. What's more, this is the fourth successive year that ACs have sparked the winning plane.

AC Aircraft Spark Plugs have proved their high quality in millions of hours of flight in private, military and commercial planes. You'll find ACs best for the plane you fly. Get them today from your AC supplier.

Aircraft Care starts with AC

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AC SPARK PLUG ⚛ THE ELECTRONICS DIVISION OF GENERAL MOTORS

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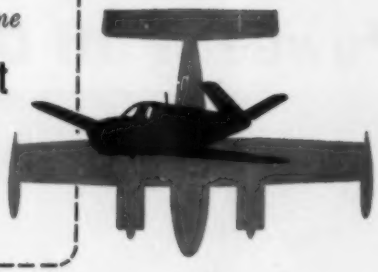
now you can buy a genuine

Mitchell Autopilot

for only

$1,095



Mitchell 2-Control Autopilot, now approved for most 4-place, single engine business aircraft, brings airline precision to private flying at a cost so low you can't afford to be without it. Providing positive roll and heading control, your transistorized Mitchell holds you on course while you devote full attention to navigation, radio procedures, and traffic. And with the Mitchell, you can make turns to any desired heading, completely hands off, with no restrictions on magnitude of turn. "Step" turns are unnecessary when you fly with a Mitchell.

Because the 2-control Mitchell uses the same precision electronic components as the 3-control model, it can be converted to a 3-control system simply by adding pitch control. The 2-control model is also available with new automatic heading selector (at $1480) that lets you dial your heading on a fully visible azimuth ring built into the directional gyro. Easy and inexpensive to install . . . uses less power than your instrument lights. And when you buy a Mitchell, you get the automatic pilot that's been used on more record-breaking endurance and distance flights than any other make.

For illustrated brochure, write Mitchell Sales Agency, Dept. 24, Box 1181, Fort Worth, Texas

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No. 1 "SERVICE MODEL" Resilient Surgical Stainless steel with adjustable plain clips..... **$4.50**

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5/8" and 11/16" lug widths
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in the presence of a high concentration of oxygen.

Don't light cigarettes or allow anyone sitting near you to smoke while you are using oxygen nor for ten minutes afterwards.

Now for some "debunking." There have been stories told of tooth fillings becoming loosened by breathing oxygen. These stories date back to the early days of the war when military pilots, instead of using oxygen masks, took their oxygen through a mouthbit, which was something like a pipestem which was held in the lips.

The oxygen coming out of the pipestem was cold, and the cold oxygen impinging on the teeth could cause shrinking of gold or silver fillings. In time this could allow bacteria to penetrate between the filling and the tooth, causing the filling to loosen.

Another yarn which has been given too much credence is that oxygen is poisonous. This is absolutely untrue as far as the use of oxygen in aviation is concerned. Oxygen can be poisonous if it is breathed at high atmospheric pressures, as in diving 30 feet or more under water. But medical authorities have stated flatly that 100 per cent oxygen is in no way harmful when used at altitudes above 5,000 feet even for prolonged periods. Below 5,000 feet, 100 per cent oxygen may cause some lung irritation if breathed continually for several hours.

The truth of the matter is that oxygen is the most indispensable element in our environment. We can live for weeks without food, or for days without water but, deprived of oxygen, we die in minutes.

So remember, whether you are young and healthy or old and decrepit; whether you are skinny or obese; whether you are male or female; you need oxygen when you ascend above your normal environment. Take oxygen with you and use it, not to cure hypoxia but to prevent it. You'll feel better and live longer! END

OXYGEN-LACK AND NIGHT VISION

Oxygen-lack and fatigue probably are the major factors responsible for retarding night vision, the Flight Safety Foundation reports.

Quoting a human factors specialist, the Foundation said, "Fatigue is a cumulative condition which causes gradual but increasing deterioration of visual acuity. Hypoxia (or oxygen lack), however, has an immediate effect, especially on night vision. The following table illustrates how night vision effectiveness decreases at increasing altitudes when no oxygen is used."

Altitude in feet	*Percentage of decrease in night vision effectiveness.*	
	Maximum	Average
4,000	8-10	5
6,000	15-20	10
8,000	25-30	15
10,000	35-40	20
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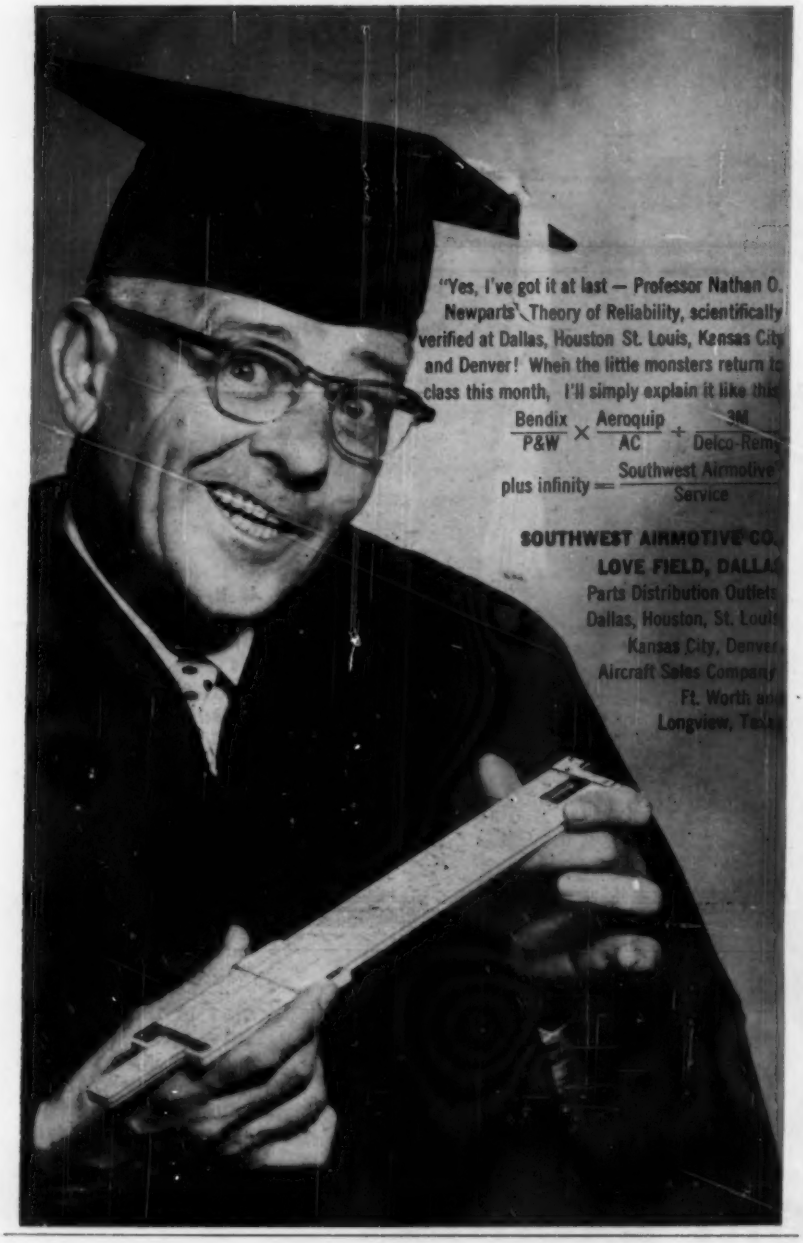
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Rockwell

(Continued from page 43)

management's function over and above necessary regulation in the public interest.

There remains a very large and vital section of the industry which has great appeal—it is the area of general aviation and particularly the business flying end of general aviation. I will not enumerate here the statistics about general and business aviation since they are not well known to most everyone. I will merely state to those of you who know and understand this part of the business that we became completely convinced of the great growth possibilities in this field. In addition to special studies on the subject, we had our own experience in using business aircraft as a company and as individuals to help us reach a conclusion.

The urgent need for executive mobility has multiplied at an even greater rate than our general economic growth. Decentralization of industry and shortage of executive manpower all contribute to the pattern which for some companies has doubled executive travel every five years.

At the same time available public transportation has been undergoing vast changes. The railroads have virtually abandoned the passenger business. The nations airlines, with their transition from DC-3s at the end of the war to larger twin-engine aircraft and much larger four-engine aircraft, left a major void for the smaller communities.

An attempt was made to correct this by establishment of feeder airlines. The failure of this effort is well documented. Even the name has disappeared and the so-called local service carriers are now moving up the same path with purchases of F-27 aircraft and with their eyes firmly fixed on the terminal to terminal market rather than the still very poorly served smaller communities.

So the void still exists. With over 6,000 communities in the nation providing adequate airport facilities, the total number of these served by all the airlines put together is less than 600. Private automobiles, trains and buses are too slow. While coast-to-coast schedules and service between major terminals have vastly improved with jet airline equipment, the intermediate cities have regressed.

An analysis of the business aircraft users shows they range through all classifications of industry and activities. The usefulness of business aircraft is determined primarily by their requirements for travel and the nature of that travel with respect to intermediate cities to be visited.

The extraordinary thing about the potential for business flying is that there are many thousands of firms not now using corporate aircraft which have similar types of business and travel requirements to those firms which have found company planes to be advantageous. Thus the business can be described as at the very threshold of a much larger and wider application since the potential among the firms not now using aircraft is many times greater than the simple potential for replacement aircraft within the exist-

(Continued on page 80)

PLANE FAX

by STANDARD OIL COMPANY OF CALIFORNIA

Specialists in rugged flying

Dropping supplies to Colorado river boats... flying emergency patients from the Navajo Reservation... patrolling timbered areas for the Forest Service... scouting pipe lines... flying search missions... these are strictly routine assignments for W. C. (Tex) Wright and his wife, Beth.

As owners of the Wright Flyte Service, based in Flagstaff, Arizona, this couple hauls anything... anywhere... in the rugged badlands of the Utah-Arizona border. No matter what the purpose, their flights usually have two things in common: they are over wildly remote areas, and the landing strips (if any) are merely dirt tracks.

"We use our planes—but hard!" says Mr. Wright. "That's why we protect 'em with RPM Aviation Oil Compounded. Take our Cessna 182, for instance. After 1250 hours of operation, we pulled its engine (a 230 HP Continental) for a major, and found the *only* parts that showed wear were one wrist pin, and a lobe on the cam shaft!

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TIP OF THE MONTH

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(Continued from page 78)

ing market.

This is the premise of our optimism for future growth and is indeed the premise for Aero Design's sales program aimed at getting non-aircraft owners into the business fleet.

Like many other companies, Rockwell-Standard's answer to this problem has been a fleet of corporate aircraft which, among other types, has included an Aero Commander. Thus we were in a position to evaluate the general and business aviation industry from the point of view of a corporate aircraft owner and operator. We concluded that this end of the aviation industry held great promise in terms of the future.

In consideration of the specific case of Aero Design and Engineering Company, we felt this firm met our principal requirements.

First, it has demonstrated success from the growth and profit angle. We were persuaded that future prospects for the firm were even greater.

Next, the product was one which was compatible with our general manufacturing activity.

Third, the product itself had clearly established the reputation of a leader. Its superior performance made it outstanding in a field of many fine aircraft.

Fourth, it had an energetic and aggressive management group. From a standing start in 1951, this firm had slugged its way up to first place among corporate aircraft manufacturers making a fair profit, using private capital and without any government subsidy or substantial government orders. It was our kind of an outfit.

We consider our entry into aviation as an important recognition of the significance of business flying and the increasing significance it will have in years to come. Specifically, our acquisition of this company has been good for the parent corporation as well as providing means and resources for future growth and development of Aero Design.

They have a slogan down at Bethany, Okla., where the airplane is manufactured —"Aero Commander Means Business." So does Rockwell-Standard. END

Small Planes Big Jobs

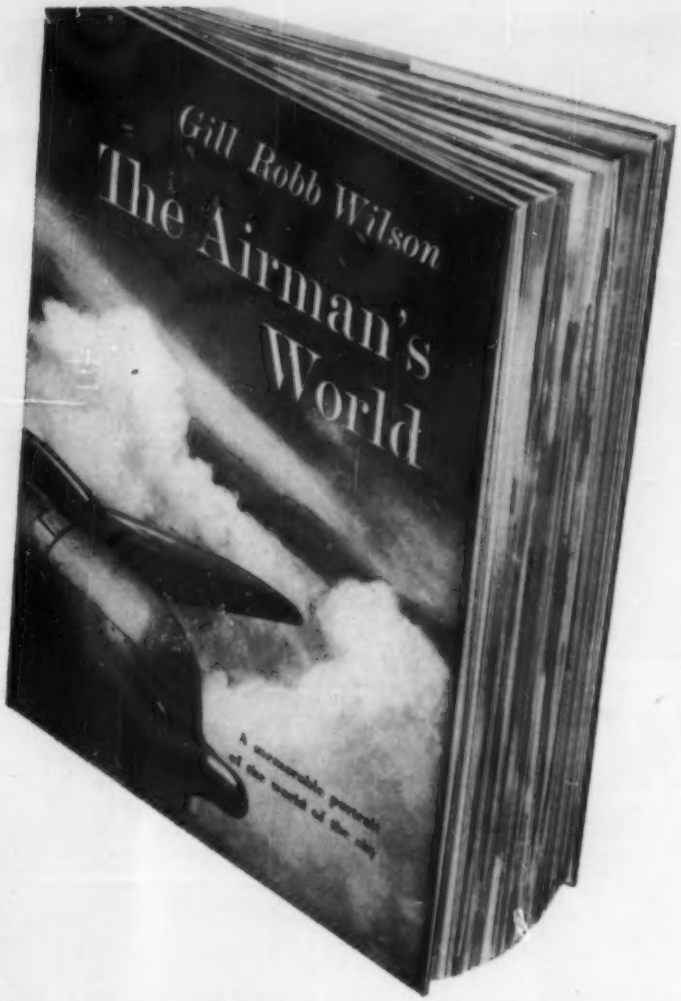
(Continued from page 64)

alone operates a DC-3 and two Model D-50A Beech Twin Bonanzas. The DC-3 has flown a total of 21,793 hours since it was bought from TWA in January, 1950. It was in regular scheduled service between Burbank and Palmdale while the latter facility was under development and made as many as four trips daily. Now, it flies only as required, still principally to Palmdale but also on trips to Sacramento, Los Angeles International Airport and Ontario, home of Lockheed Aircraft Service.

The DC-3s seat 37 persons and are used primarily for flying large groups of personnel within the California complex. The two Twin Bonanzas were purchased last September to carry the load when requirements are smaller. In the short period in service, the Bonanzas have

(Continued on page 82)

"...a sense of freedom such as man never dreamed"



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A WORD ABOUT THE AUTHOR

Gill Robb Wilson was a pilot with the French Escadrille 66 in World War I, president of the U. S. Air Force Ass'n, president and organizer of many flying groups...and is now the noted editor and publisher of *Flying* magazine. He learned to fly just after the Wright brothers successfully propelled their flying machine above the ground, and has been one of the leading figures in aviation ever since. In his book, author Wilson conveys the feelings known only by men who are at home in the sky, and explains this exalting sensation to those who have never flown.

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(Continued from page 80)

logged 245 and 317 hours respectively and have replaced three Model C-50 Beech aircraft which had flown a cumulative total of 3,600 hours from the fall of 1955 until they were sold in September, 1958.

North American Aviation also operates a mixed fleet. The reliable DC-3 for high-load, regular service and light twins—three Piper Apaches and an Aero Commander—for diversified assignments. NAA's miniature airline is built around the DC-3 which makes daily round trips to its test center at the Air Force's Palmdale facility and other points, depending on current contracts. The Apaches tag along to carry any of the DC-3 overload, but also have their specific schedules to carry one to four people along regular routings to Edwards, San Diego Naval Base, China Lake at Inyokern and the San Bernardino Air Materiel Area.

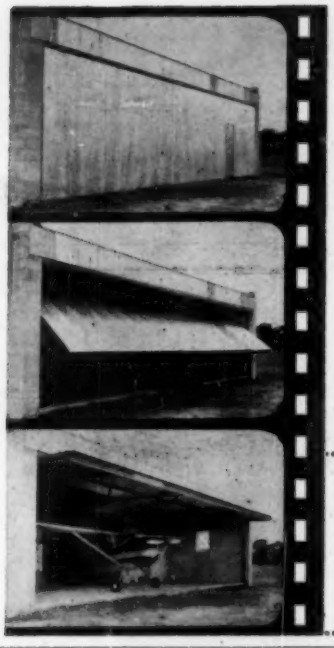
The Northrop Corporation has put a Bell 47J helicopter to work for intraplant travel. Others in the huge defense complex also own and operate helicopters but basically for air/sea rescue and an occasional photographic mission. However, Northrop's is a hard working machine that makes two daily round trips in the corporate sphere. Starting from its base at Hawthorne, home of the Norair division, it goes into Van Nuys, where the Radioplane division is located, and Anaheim for the Nortronics Division. Corporate headquarters at Beverly Hills will be on the route as soon as city ordinances are amended to permit such flights. The helicopter carries classified mail among the various plants and is used to carry personnel and military customers.

Like other firms in the complex, Northrop also owns a DC-3 and a twin Beechcraft which it occasionally uses for executive trips around the country or to carry personnel on an "as needed" schedule around the defense centers.

Aerojet—General Corporation owns a fleet of four aircraft—two DC-3s, one Dove and a recently acquired B-23. The DC-3s, operated at a 90 per cent load factor, make seven scheduled trips a week between their base at Ontario on behalf of headquarters at Azusa, to its huge manufacturing facility at Sacramento. The Dove is the company's air taxi—it flies all off-route points to San Diego, Los Angeles, Inyokern and Edwards and is pressed into service often to make airline schedules at Los Angeles International or Burbank terminals. Aerojet DC-3s carry all interplant confidential communications and critical papers and each flight carries some critical piece of equipment or part needed at Azusa or Sacramento.

The vital role played by the defense industries' utility fleet is multi-fold. Programs no longer need be delayed because of a missing part or expert.

By maintaining a fleet of balanced equipment—the faithful workhorse DC-3 to the small twins—the huge contractors get a variety of tasks accomplished without waste. The greatest testimonial to the utility of the fleets is found in their stability. Despite budget cutbacks over the past two years, the companies continued to operate their fleets virtually without change. END



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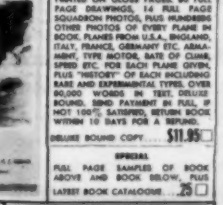

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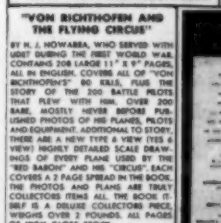

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According to the accommodations, rates vary: Single occupancy $9 up; double, $12 up; two, three, four persons in a room, $15-$17 up. Suites are $15 to $60 per diem. A roll-a-way bed in room is $3 extra. (Prices, naturally are subject to change without notice.)

As a major airport with full airline service, Washington National Airport is completely equipped and lies 5 mi. S. of the city; 2.2 mi. S. of the Monument. Two-way radio is required. Private aircraft request clearance to Butler Aviation located on the northern end of the airport in Hangar #9 and part of MATS Terminal.

Clear That Title

(Continued from page 66)

owner's application is mailed to FAA, it is illegal to fly. In case of an accident, an insurance policy with a legal flying clause may become invalid.

Liens or mortgages also must be checked. From the four-engine transports of the biggest airlines to the smallest Cub, mortgages are usual in purchasing planes or in pledging them as security for other financing.

Copies of all such incumbrances should be filed with FAA to be sure they become binding. The liens may be recorded also under the laws of states and some counties or municipalities. But the lender might have a hard time collecting if the plane flies to another state and the lien is not on record with FAA.

When a bank is about to make a loan with a plane as security, it is usual to search at FAA to see if any liens are outstanding. Several Washington firms do this for a modest fee.

The Aero Title Co., for example, charges $15 per aircraft and usually is able to report the same day. Warren E. Miller of Aero frequently handles requests for reply by wire or long-distance phone. If he

(Continued on page 86)

step in and step up . . .

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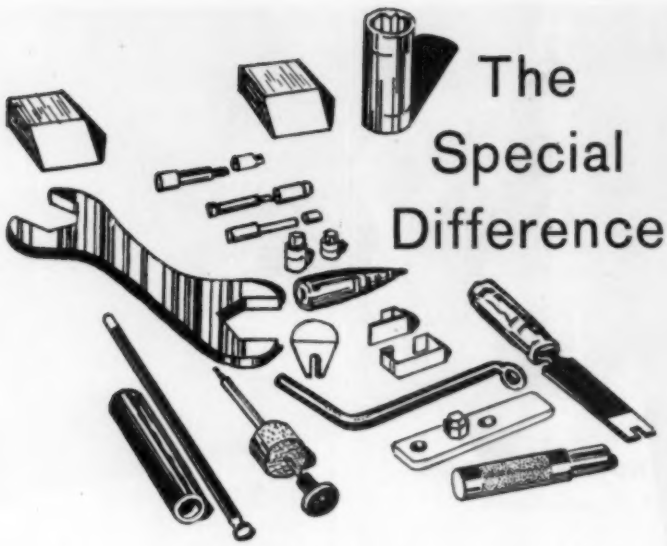

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(Continued from page 84)

finds no claim outstanding, filing of a bill of sale follows.

In Mr. Miller's opinion, comparatively few cases of fraud occur. It is just a matter of closing gaps in the paper work. For example, a recent search showed two mortgages on a plane after the owner had claimed there was one. But the earlier mortgage had been paid and it was possible to file documents to prove it.

Since the people whose signatures are essential cannot always be found when needed, it is wise to see that files are always current.

For protection of lending institutions, according to Mr. Miller, contracts of conditional sale are becoming popular in lieu of chattel mortgages. When a plane is sold, a recorded mortgage is undisturbed and continues to apply. Under a contract of conditional sale, between seller and buyer, the buyer is recorded as the new owner. But before title can pass to someone else, the previous owner must release any lien he holds on the aircraft.

Liens on aircraft engines of 750 hp or over may be filed with FAA, a point of interest to business flyers with larger planes as well as to air carriers.

William K. Lawton, Executive Director of the National Business Aircraft Association, urges that company managements take an interest in the legal aspects of plane ownership. Often they leave everything to their pilots, busy with the exacting job of keeping the planes in the air and unfamiliar with details of insurance and law.

Foreign transactions must be handled with especial care, Mr. Lawton warns. When a plane is exported or sold to a foreign citizen, U. S. status lapses. FAA will register only in the names of U. S. citizens.

In a recent case, a British plane was bought by an American company. Under treaty provisions, the British registration would have been transferable here as ours would be to Britain. But the plane meanwhile had been sold in South America, so establishing U. S. registry was quite a tangle.

A search of the FAA records in Washington may reveal much about the condition of a plane. Certified mechanics and FAA field inspectors are supposed to turn in reports of overhaul and airworthiness to Washington via the FAA field offices.

The applicable federal rules are set forth in the Regulations of the Administrator, CAA, Parts 501 through 505. FAA still is operating under the old CAA regulations and frugally using CAA forms until they are used up, or until a seal can be devised for the new agency and new forms printed.

Checking with FAA will not solve all problems. One anguished party wanted FAA to put a STOP on the file after selling a plane for a rubber check. But a notarized bill of sale is accepted by FAA, regardless, and other matters are between the buyer and seller.

Anyhow, it is prudent for owners to see that all pertinent papers go to Washington for the information of all who may ever be concerned with the title or airworthiness of the airplane. END

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To Paris by Aero Commander

(Continued from page 36)

countered difficulty with overnight accommodations. The austerity program has hit our military bases and, with no rooms available in St. John's one hotel, they were hard put to accommodate us in the BOQ at Pepperill.

A pleasant note was added, however, by permission being granted us to dine at the Pepperill Officers Club where the Newfoundland chef, Fred Evans, very kindly put up a box lunch of fried chicken and all the fixings for our next day's flight. This, together with a thermos of water, constituted our "supplies" for the crossing, plus, of course, a life raft and Mae Wests stowed aboard the plane.

Next morning, after the usual two to two and a half hours of weather briefing, flight planning and paper work, we were off by 7:10 local time for the approximately 1,600 mile run to Santa Maria. Ahead were 7 hours and 22 minutes of very interesting, if unexciting, flying on top of broken or solid overcast, most of the way at 11,000 feet. Making this leg at 55 per cent power, we still had a good two and a half hours of fuel remaining on arrival—not enough to go anywhere but a fair margin for stooging around if the weather at Santa Maria had not been good.

On the ground at Santa Maria we were greeted by Antonio da Cruz, Portuguese government representative and a long time friend of international private flying, who eased us through the formalities and aided our stay on the island with true Portuguese hospitality. He also gave us the news that Max Conrad had that day not only broken the single-engine distance record but had gone on beyond El Paso to land at Los Angeles (see story on page 61). Max was an old friend, being almost an Atlantic commuter, and had made many a stop at Santa Maria.

The next day our 880-mile flight to Lisbon was accomplished in 4 hours 11 minutes of very smooth flying and 7 minutes ahead of our ETA. Take-off at Santa Maria had been particularly interesting. Jerrie and I had been discussing the short field performance of the 680E the night before and, to demonstrate the point next morning, she hauled it off at 80 mph, full 7,500 pound maximum gross, climbing out at better than 1,500 feet per minute.

The flight from Lisbon to Paris was made after a very pleasant week end at Estoril, the famous Portuguese resort. Since you just don't enter a foreign country with an export airplane on a Sunday, we had spent the extra day sightseeing by taxi. And since another stop at Madrid would throw our Paris schedule off, we decided on a direct 1,060-mile Lisbon-Paris route, which would take us diagonally across Portugal, Spain, the Bay of Biscay at Biarritz, over Bordeaux and up the Loire valley.

Most of our route would have broken and scattered cloud at 5,000 so we cleared for 3,000 in order to see the countryside, only going on top for a few minutes to cross the coastal range of mountains in northern Spain. Communications were

(Continued on page 90)

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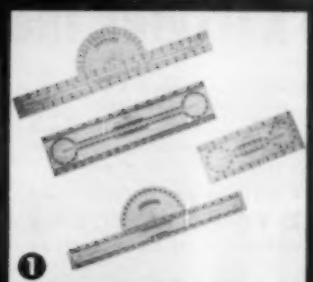

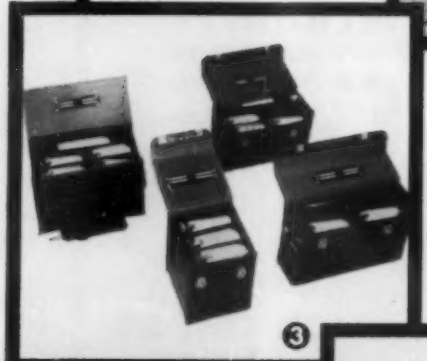

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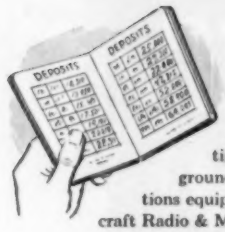

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SIE

(Continued from page 88)

excellent, all in very good English, though Jerrie's Oklahoman ear and pronunciation tangled occasionally with calls like Valledolid, Fuenterrabia, Merignac, Poitiers and finally the tower at Toussus-le-Noble, the sport and business flying field near Versailles, and headquarters of Fenwick Aviation, French distributors for Aero Commander.

The five hour 8 minute flight was perfect from a sightseeing standpoint—low enough to take a good look at castles in Spain, and chateaux in the Loire valley, to see the red tile roofs of southern France change to grey slate farther north, and finally to see the Eiffel Tower on a grey horizon that was Paris. The slight turbulence under broken cumulus gave me an opportunity for the first time to feel the 680E as a thing to fly—before it had just been a matter of adjusting trim as we burned off gas. It responds neatly and positively, without yaw or pitch—a good, solid machine.

Bare statistics of the flight showed a total distance from New York to Paris of 4,730 miles; total elapsed flight time 22:28; average ground speed around 210 mph, though on the long hop to Santa Maria we made good 220 mph even with a detour through the front. Fuel consumption averaged out at about 31 gallons per hour.

Such statistics, however, do not tell much of a story. Lots of airplanes can and do make the Atlantic crossing. The calculated risk varies with the many factors involved such as pilot's knowledge of the Atlantic, the equipment available for navigation and the pilot's ability to use it, the fuel load and consumption of the engines, whether your equipment allows you to go above or around the weather—or through it. And so on for an infinite number of items.

As for our flight I can only report that we had superb luck with weather all the way and that the plane, although it started with only 14 hours break-in and might be expected to develop a few bugs, performed like the thoroughbred it is.

An old saw has it that flying is hours and hours of boredom relieved only by moments of stark terror. If this is true, then our flight was the exception that proved the rule for there was not a moment of boredom nor a split second of terror.

I have been asked many times since the flight if I now feel that crossing the Atlantic in a light twin-engine aircraft can be considered as a routine undertaking for the average businessman who wants to have his plane available for travel in Europe. There can be no categorical answer to such a question, since there are too many factors involved. In the first place, if he's in a hurry, he'll ride the jets. But if a businessman is himself a professional pilot with considerable knowledge of Atlantic weather and navigation, or hires such a pilot to do the flying—and if he has time to wait out the worst of the weather en route or, as we did, schedules an overnight stop at each re-fueling point—then the remaining element of risk merely adds a bit of sporting zest to what can be a memorable and worthwhile experience. END

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Fuel Economy

(Continued from page 60)

In view of this, it is then understandable that when flying at 10,000 feet or above, it is often necessary to place the throttle full open in order to get sufficient manifold pressure. Under these conditions it is especially economical to lean out the mixture for reasons that will soon follow in the section which will deal with lean-out procedure.

- *Air temperature:* The effect of air temperature is not as prominent on fuel consumption as is rpm and manifold pressure, but it is a factor. It is explained by the fact that the amount of power that an engine can develop depends upon the amount of air and gasoline vapor which can be drawn into its cylinders.

At a given altitude of flight, the air will be less dense when it is warm than when it is cold. Under conditions of warm outside air, the engine will develop less power and consume less fuel. If all other factors remain the same, the air temperature effect is approximately one per cent decrease in engine power and fuel consumption for every 10.8 degrees F. increase.

- *Altitude:* This factor is considered since, as an aircraft goes to higher levels, the atmospheric pressure becomes less and this means that the back pressure on the exhaust gases from the engine is less. With less pressure against them, the exhaust gases can get out easier and this in turn enables more air-fuel mixture to enter the cylinder on the intake stroke of the piston. With more volume of intake, the engine delivers more power and burns more fuel.
- *Fuel-air ratio:* The adjustment of the mixture control will directly affect the fuel-air ratio, and that technique is the essence of this article. However, before getting into the subject, a word of caution should be mentioned. It is possible, by improper leaning, to burn out an engine. In view of this I have made it a practice not to lean when using more than 65 per cent of the engine's rated power and, under normal conditions, not to lean for take-off or climb, but for cruise only.

The reason for this practice is that in reciprocating engines the purpose of fuel is twofold. First, fuel supplies the chemical combustion power to activate the engine; and secondly, it serves as a coolant. Normally more fuel than can be burned with the amount of air available is supplied to each cylinder. It can be seen readily that cooling by a rich mixture is advantageous at take-off when the engine is called upon to deliver full power, and yet the airspeed is not adequate to bring about the amount of cooling required. Likewise in a climb, the rich mixture will aid in cooling the engine.

Many carburetors used on engines powering lightplanes have a linkage system built into them which automatically provides an extra rich mixture whenever the throttle is set more than three-quarters open. This fact should be remembered when flying such an equipped airplane at altitudes (usually 10,000 to 15,000 feet) where the throttle must be opened all the way in order to get whatever manifold pressure you can. Without supercharging, it is difficult to get the manifold pressure you desire. The extra rich mixture is not required for cruise and, for economy, the excess fuel can be removed by leaning the mixture.

Incidentally, the leaning procedure is a smooth, gradual adjustment and must be reset whenever the altitude and/or power setting of the engine is changed, or when using carburetor heat. In brief, the mixture control is pulled gradually until the engine begins to get rough and then it is pushed in slowly until the roughness disappears. During this time the cylinder head temperature gauge should be watched for any increase in reading above normal.

Let us see what takes place in an engine when a pilot begins to lean the mix-

(Continued on page 94)

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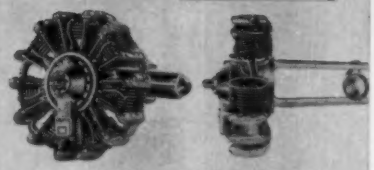

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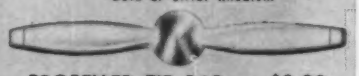

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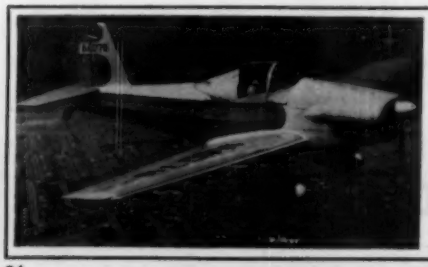

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(Continued from page 92)

ture. If the engine were in a test cell where all the changes would be reflected by instrumentation, we would notice that during the first phase of the lean-out there would be little change in horsepower output. However, we would see the rate of fuel consumption begin to drop as, through leaning, some of the excess fuel is being prevented from getting into the cylinders.

If we continue to lean, the cylinder head temperature will start to rise sharply as all the excess fuel used for cooling is cut off. This fact again emphasizes the inadvisability of leaning out on take-off or in a climb where the airspeed is low and engine power requirement high.

Also, as the leaning continues, we will notice that the horsepower output begins to fall off slightly. This is due to removing all the excess and now part of the fuel used for combustion. And in keeping, the fuel rate of consumption will continue to drop.

Going further with the leaning, we will find that the cylinder temperature will go down again. This is because we have removed so much fuel that the amount of combustion is affected and therefore the power output of the engine. Of course, keeping in stride, the rate of fuel consumption has continued to drop proportionally.

This is the point of the lowest allowable fuel consumption for the original cruise power setting before leaning. Not only is the fuel consumption down, but the engine is operating cool again—a good combination for maximum range cruise. (Editor's Note: The author of this article, while not a Max Conrad, is an old hand at getting the most out of a B-17 or a B-29, and we therefore suggest that this extreme leaning procedure be studied with interest but practiced with caution. Certainly it should not be undertaken without a cylinder head temperature gauge).

What happens if we continue to lean beyond this point? As soon as the rate of fuel consumption reaches its lowest point, it would then ultimately rise and the engine would run so rough that a pilot would feel uneasy and disturbed riding behind it—don't try it!

This roughness of engine which is brought about when leaning, is caused, in general, by the single carburetor unable to equally distribute air-gas vapor to four or six cylinders as the mixture is thinned out to extreme. Under such conditions some cylinders get too little mixture to perform, and then offset the tempo of piston movement and bring on the uneven running.

If, during leaning and when in that optimum low rate of fuel consumption area, the engine indicates that it is on the fringe of roughness, a little tip is to crack on a little carburetor heat. This has the effect, on most engines, of aiding towards a more even distribution of mixture to each cylinder. Applying some carburetor heat will, of course, mean a slight drop in engine power, but you still will have that low point of fuel consumption and can enjoy economy and the other benefits of long-range cruise. END

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Manger Hotels' Plane

(Continued from page 53)

but also the hotel world didn't move at the pace it does now. I remember my father telling stories of how he used to have time to check the books nightly at the company's hotel in Washington, chat with all employees from the mail clerk to the manager, and still find time to run as many as 16 hotels in New York alone, and raise a family."

Mr. Manger also points out the saving in plane charters and commercial air fares, which occur any time more than one person travels in the Cessna, adds up to a paper profit in transportation savings.

He frequently takes executives along with him, either to handle an emergency or to supervise renovations and innovations at one or another of the hotels. Frequent passengers, for example, are Arthur Finn and William Jenter of Finn/Jenter, the hotel chain's architectural and interior design consultants. With the building of a new motor inn in Charlotte, and negotiating for several other properties, Finn and Jenter are constantly traveling to check plans, review bids and supervise construction. Don Zilli, chief engineer for the chain, is another frequent passenger, often needed for emergencies as diverse as checking a new air-conditioning system or correcting a defect in a heating plant.

Since Manger feels that good employee-employer relations are necessary to set the foundation for good guest relations, he tries to visit each hotel about every four weeks. This close contact, not only with the respective managers of the hotels, but also with the complete hotel staff, is invaluable.

He believes that remote or sporadic forms of communication—ranging from telephone calls to standard department head meetings—can never fully replace face-to-face personal discussion. In addition, non-executive personnel, many of whom would probably never see the chairman of the board of their company in an absentee-management situation have learned that he will be visiting the hotel several times a year. His apparent concern and interest in their own hotel gives added impact to the importance of a particular training message or policy.

The value of such direct personal contact is not easily measured on a graph or profit and loss statement, but is merely one of a series of principles which have contributed to an almost double total gross in sales and income during the chain's expansion program in the last few years.

Mr. Manger feels that his frequent appearances at each hotel mean more than lending executive prestige to specific policies. "We believe strongly in a message placed in every hotel room which states that a hotel is a human institution to serve people, and not merely a money-making organization. Therefore, the full co-operation of every staff member on the hotel team—from bellmen to specialized executives—is essential to carrying out our policies and beliefs.

"Like air transportation, the hotel business has become one of the most competitive fields in the United States.

(Continued on page 98)

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(Continued from page 96)

More companies with comprehensive lines and more varied products require more representatives on the road. And, as the standard of living continues to rise, more Americans travel farther on vacations, constantly pressuring carriers, hotels and motels alike to expand and improve their facilities and service to keep pace with competition and consumer demands," say Mr. Manger.

He describes the Manger chain's continuing expansion program as one that will, more and more often, take him to major cities which are not on main air routes. "Not only is the Cessna valuable now, as we negotiate for building sites, but once we complete a new motel or hotel, the company plane will become even more useful and effective."

Another area in which the company sees a potential benefit from the plane is in the realm of sales development in seeking conventions and group business. The plane will enable Manger sales representatives to convass nation-wide organizations and associations and to solicit new convention business thoroughly and quickly by efficient air scheduling. The personalized aspect of being at the right spot at the right times is a distinct asset in sales.

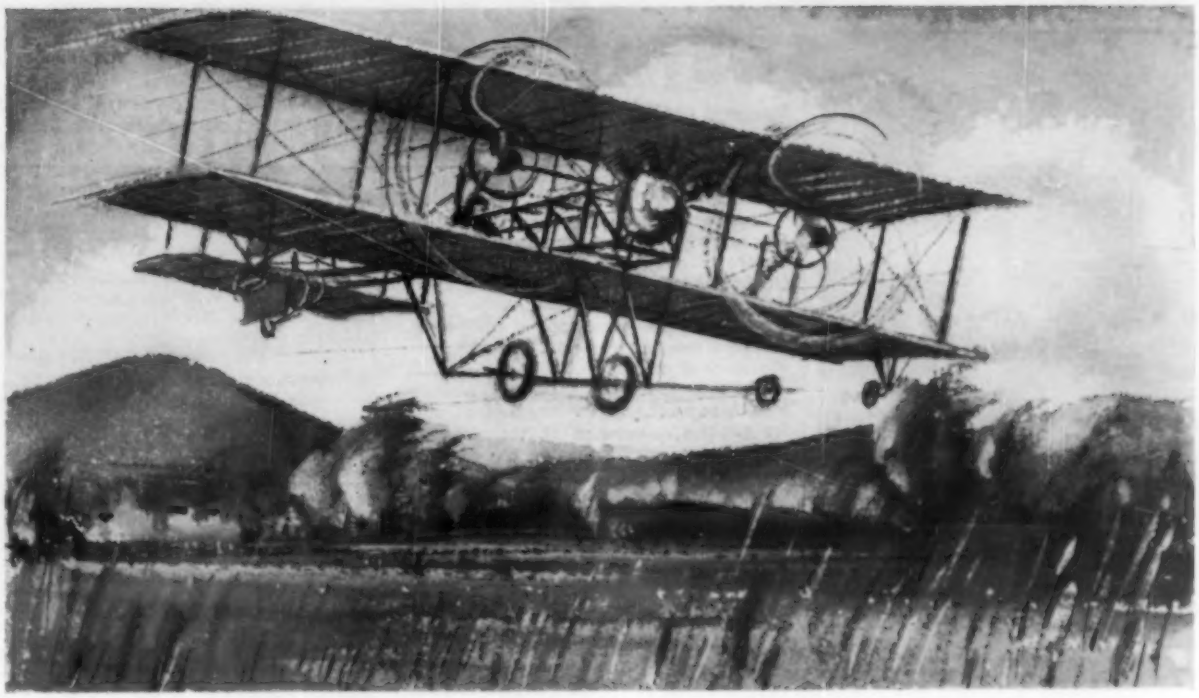
With this end in mind, several sales representatives are learning to fly. And, among the Manger executives, one of the most enthusiastic neophyte flyers is Hugh O'Donnell, president of the chain, who is working toward his pilot's license.

The results of owning the Cessna, in terms of executive time saved, quick and efficient solutions to building and maintenance problems, the facilitating of close employee contacts, and the potential of increased sales opportunities have been so outstanding that Mr. Manger and his top executives have discussed moving the sales and executive offices to Westchester, in order to take full advantage of the convenient Westchester Airport.

While the plane is an invaluable aid to Mr. Manger in his business, it is also a distinct asset in his personal life—the time-economy factor allows him to spend more hours at home. He now finds more time to enjoy with his wife and family—seven children, ranging in age from four to 18 years. Through the use of the plane he also finds more time for church and community affairs. He can also indulge more frequently in his favorite sport, tennis.

Summing up the assets of plane ownership, Mr. Manger concludes: "Recently, Arthur Finn, Bill Jenter and I had to inspect our new motor inn in Charlotte; then we planned to swing down to Savannah to check some renovations at the hotel there. We saved a total of four or five hours in waiting time at New York airports and waiting between flights in Charlotte. There is practically no airline service between Charlotte and Savannah. The trip home involved the same time saving—or about ten hours—more than a full working day saved by using the Cessna."

That's a lot of time saved for a man who has flown 20,000 air miles in the past five months. END



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Transition to Turbines

(Continued from page 39)

Manager, Charles Lewis, has overall responsibility for Gulfstream training, and Don Wolfe, formerly head of Fairchild's engine training program, is administrative director of the program.

Both men have long experience in military and commercial maintenance and service training and, in the case of the Gulfstream, they are concentrating upon making the program as flexible as possible so that the maximum of individual attention can be given each of the 30 to 40 members of each class.

The three-week course is broken down into three main phases. The first week is for general orientation on the airframe and powerplant. Everyone attends this session. At the beginning of the second week, the group is divided into Airframe-Powerplant and Electrical Systems.

The last day or two is devoted to combined class discussions of their training experience and a review of the special problem areas which may have developed as a result of the varied backgrounds and level of student experience.

"We realize that many of our men have been working on the same airplane for ten to 20 years—and that they may have 'grown up' with their airplane," said Earl Schaeffer, Gulfstream training coordinator. "As a result, heaping a huge work load on such a man without the benefit of individual instruction may tax his ability to grasp the information quickly. For this reason, we try to stay as flexible as possible and have designed our course to keep that man as near as is practicable to the airplane on the production line."

Schaeffer said that the Grumman course of instruction was designed originally on the basis that each man would have completed the Rolls-Royce training before coming to Bethpage. However, only five per cent of the first class had the Rolls training and only 15 per cent of the second. These early classes included not only customers but Gulfstream distributor personnel and FAA staff people.

This experience showed that business plane operations staffs, which are by nature very small, find it difficult to stay at school for long periods. As a result, the training schedule was revamped to strengthen the engine area of study. The revised program was placed into use beginning with the September classes.

Naturally, a detailed schedule of training includes the general design characteristics of the Gulfstream and detailed study of all its systems, both mechanical and electrical. But for brevity, some of the major areas of study—as they differ from piston-engined transports—will be highlighted here.

On the first day of the course, following a welcome and introduction of Grumman instructors, Schaeffer loses no time in accenting the fact that new airplanes—being more complex systemwise than the old—bring the end to maintenance that is a "one-man band" operation. Cabin pressurization, automatic electrical control systems and, of course, radar, make it essential that maintenance be placed on a specialist's basis.

Even though responsibility for a one-plane operation can be handled easily by one man, he must accept the fact that outside specialist services must be used more now than was necessary on an unpressurized DC-3, Lodestar, B-26 or other converted combat type planes.

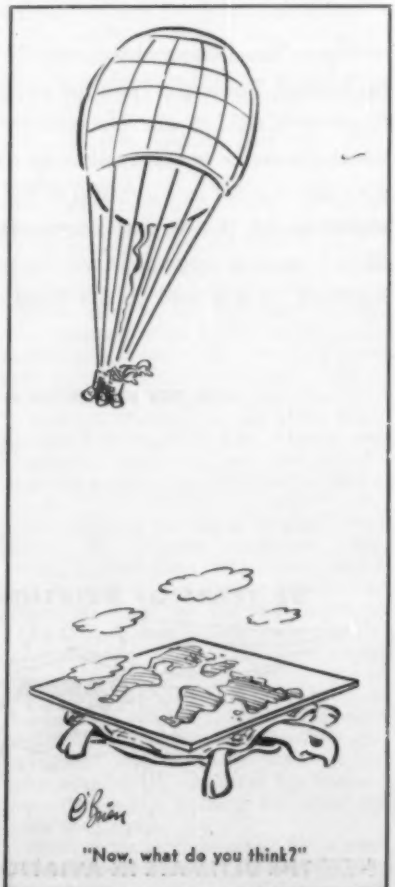
Pilots and mechanics are then introduced to the various systems of the Gulfstream. Intermittent visits to the production shop—one floor below the classroom—provide graphic training to be phased in with theory and lecture type study.

The first week accents powerplant control and operations, the Rotol propeller system and environmental control which includes cabin air conditioning and pressurization. Each of these topics represents systems and equipment new to piston engined flight and ground crews, so a major portion of the first week is devoted to the operation and line maintenance of this equipment.

Fuel management and the operation of the Rolls-Royce Dart under varying temperature and altitude conditions comes in for considerable emphasis. Engine starting technique is different and must be explained fully to facilitate transition.

In this particular department, earlier Rolls-Royce Dart engines have a strict starting procedure. If the starter button popped out during the operation, some pilots automatically depressed the button before the propeller stopped. This caused stripping of starter gears and premature

(Continued on page 102)



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(Continued from page 100)

overhaul of the engine to clean chipped metal from the system. The cost ran into thousands of dollars and caused some embarrassment to pilots.

There is an automatic cut-out circuit linked to the starter now which prevents re-engagement of the starter while the propeller is turning.

Since the Rotol propeller is almost completely automatic, two days are devoted to the study of this important component.

Some pilots find it difficult to develop proper engine and propeller procedure until they have had an opportunity to study the inner working of the Rotol system. Since they have become used to the U. S. type of reversible pitch propellers, the Rotol ground fine-pitch braking aid is hard to understand.

Grumman engineers show that braking action of the Rotol system during the high speed portion of the landing operation provides effective deceleration. But, unlike the reverse pitch propeller, as the slower speeds are reached, the wheel brakes must be relied upon completely.

This also keeps Rotol prop-equipped planes from backing up, a trick usually employed by the sales pilot of a Convair type transport to heckle Gulfstream or F-27 pilots.

Environmental control is perhaps the largest new area of study for the business plane pilot, unless he happens to be converting from a pressurized Convair or Martin. Here, major accent is placed upon electronic circuits and automatic valves.

Cabin pressure air is taken off the engines and air conditioning equipment is phased into the system to provide on-the-ground comfort for passengers.

For the uninitiated, environmental control appears to be a veritable nightmare of buttons, circuits, valves and ducts. But, Schaeffer says that the greatest problem is overcoming this natural pre-training mental attitude toward the system. Once that is achieved, mechanics and pilots alike find the operation to be relatively simple.

They also develop a healthy respect for specialized attention and find it easier to repress the natural desire to explore and experiment.

Schaeffer, who specializes in electronic systems instruction, says that most pilots and mechanics, after this first week of indoctrination, are anxious to "dig" into the electrical systems of the airplane in greater detail. In fact, after the first week, each student is given the option of breaking off to attend the electrical phase of study or to remain with the airframe-powerplant group.

In cases where an electrical specialist is not attending from a business operator's staff, Grumman urges that at least one mechanic attend the electrical phase.

When asked if he recommended that a pre-transition training course in the fundamentals of electronics be taken, Schaeffer said, "It certainly is not necessary but if a man wanted to do it on his own, he'd find it very helpful, since future planes will become more and more electrical—he's just beginning to live with electronics. Such study, of course, would broaden a man's capability.

"I would say that this new plane, which incorporates the most modern features, is vastly different from the DC-3 airframe-wise because of its electrical systems. Otherwise, there is no basic change aside from the powerplant. The hydraulic systems, aerodynamic features, landing gear, instrumentation and fuel storage installations include the latest refinements but they shouldn't present any unusual maintenance training problem."

Training scheduled in the second and third weeks introduces students to the wet wing fuel system, the use and storage of water methanol for extra power at take-off, the new deicing boots with chordwise tubes, new steel brakes, nosewheel steering, the all-mechanical flight control system, windshield deicer, engine air-in duct heating, etc.

Electrical innovations include nickel cadmium batteries which can be recharged in a matter of minutes, the auxiliary gas turbine compressor-generator for engine starting and extra-emergency power system, and the AC and DC power systems.

In electrical classes, which average about half the size of the airframe and engine section, the students are eager to decipher the 59 electrical circuits on the Gulfstream, to study schematic and detailed drawings of each system, to explore the peculiarities and traits of transistorized systems, to learn what lies within the many black boxes which they may never have to touch, but where a knowledge of the nerve centers within are vital to efficient on-the-line maintenance. The electrical group, in effect, completes schematic teardowns of the systems, including weather radar units, which are part of the Gulfstream's many features.

"In brief," Schaeffer said, "We take the magic out of the airplane. We hope that, by the time the class discussion comes along at the close of the course, every man feels as though he has grown up with the Gulfstream."

From Grumman, many of the students head for Montreal. There they meet airline and business plane class members where they exchange information on techniques and experiences which pertain to other turboprops, such as the Fairchild F-27 and Vickers Viscounts.

Graduation day comes on the last day, when many of the students, with certificates tucked into their pockets, walk down the production line to "sidewalk engineer" production operations on their own airplane.

One production line employee put it this way: "You know, I'll bet that guy couldn't be any more excited building his first home. You can see pride and impatience oozing out all over him."

Thus, the mythical bugaboo that was supposed to give old-plane hands a tough time with jets has faded away with reality. This the business pilot or mechanic can believe: When the time comes for him to go through transition to turboprops or pure jets, he'll have only two principal problems—one is to study and the other is to control his patience until the bird is in his hands.

This is the opinion of men who have been there before him. END

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Socony Mobil

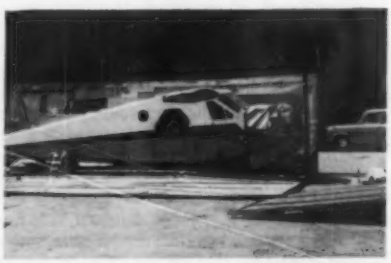
(Continued from page 45)

Socony Mobil Oil Company and subsidiaries like Mobil of Canada employ aircraft in many areas because of their speed, adaptability, economy, serviceability and, certainly in Libya, because of the safety margin they offer. It would not be easy to operate without them.

Take the case of another DC-3, this one based with the Colombian (South America) Petroleum Company, a firm in which Socony Mobil has a 50 per cent interest. Initially, to get personnel and equipment to the site of the rural Cicuco oil field from the nearest airstrip required a journey by jeep or truck, then boat or barge, and finally, another jeep or truck. An airstrip was built adjacent to the oil field to handle the DC-3, and now the once tiring and time-consuming journey of one hour and 45 minutes takes but five minutes!

There are 29 airplanes in the Socony Mobil fleet, based wherever the need is greatest. Included are six DC-3s, one Super Ventura, two Beech 18s, a Bell Helicopter, five Luscombes, four Aero Commanders, five Cessnas (a 170, three 180s and a 195), two Beech Travel Airs, a Beech Twin Bonanza and two deHavilland Beavers.

Who flies in company planes? Anybody



Socony Mobil's Beaver is delivered to Tripoli, Libya, for use over the Sahara. Its shipping crate was rebuilt into a small office (below).

whose business is vital enough. A drilling crew that must get to a remote location. A team of geologists on the lookout for new oil fields. A marketer who must get to a vital sales meeting—fast. A pipeliner. For example, the five Luscombes are used by Magnolia Petroleum Company (Socony Mobil's southwestern U. S. affiliate) for patrolling pipelines. Patrolling takes care of a multitude of problems, among them leakages and pilfering.

As one might imagine, there are a great many people doing important things each day in a company as large as Socony Mobil. Consequently, demand for use of aircraft can, at times, be quite heavy. The

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company therefore has established a basic policy for the New York-based aircraft which is generally followed throughout its operations. To secure the use of a plane, an individual must first obtain clearance from a director of the company. Then the flight is cleared through the manager of aircraft operations. Socony Mobil has an ironclad policy concerning pilots: two are required for all IFR operation.

Location of aircraft is indicative of the emphasis Socony Mobil places on utility. Only two aircraft are based in the New York area, headquarters of the company's world-wide operations. They include a Super Ventura and a Beech 18.

Excellent flying weather and great distances to be traveled in the Southwest are two reasons why Magnolia Petroleum Company operates 14 planes in its day-to-day activities. In addition to the five pipeline-touring Luscombes, the company has two DC-3s, a Beech 18, the helicopter, three Aero Commanders and a Cessna 180. All but the helicopter and the Cessna are based in Dallas.

The helicopter has been providing quick and easy access to offshore drilling operations in the Gulf of Mexico. Based in Beaumont, Tex., it is able to reach drilling installations 30 miles off shore in 20 minutes. Former time by ship: four hours! Plus an additional handicap—sometimes seasick passengers.

Available for duty on both land and water in the Louisiana Bayou country, the Cessna 180, on floats, is hangared in Morgan City, La.

Besides the DC-3 and Beaver headquartered in Libya, Mobil of Canada employs a Cessna 180 in Regina, Saskatchewan, and a Beech Travel Air and deHavilland Beaver in Calgary, Alberta. (The Cessna 180 is mounted on skis in winter, while the Beaver is alternately mounted on floats, wheels and skis.)

Mobil Producing Company, headquartered in Billings, Montana, requires a Beech Travel Air for exploratory purposes, and Socony Mobil's Central Pipe Lines Division in Wichita, Kan., a Cessna 180 and Beech Twin Bonanza.

In South America, besides Colombian Petroleum Company's two DC-3s, Mobil Oil Company de Venezuela has a DC-3 and an Aero Commander for negotiating the difficult terrain in that country. West coast affiliate General Petroleum Corporation maintains a DC-3 in Burbank and a Cessna 195 in Salt Lake City. Equipped with an 1830-94 engine, the DC-3 operates extensively up-and-down the coast and throughout the rugged Rockies where the company has drilling and exploration interests.

In all cases, maintenance, except major overhaul, is done by company mechanics.

Socony Mobil has come to learn that its aircraft provide a great saving in time for its key personnel, as well as permitting the company to transport perishable cargo swiftly over long distances. Planes also provide the company with rapid transportation to areas once considered remote. Like the Libyan desert where Rommel and Montgomery locked in classic battle 16 years ago. END

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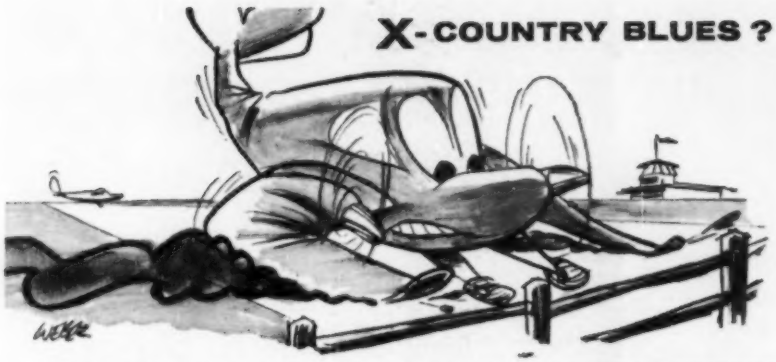

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Raytheon

(Continued from page 47)

The acquisition and operation of the F-27—which is in direct support of our missile and electronic work for the Defense Department—represents a change of company policy from flying our planes mostly to out-of-the-way points. We are carefully analyzing its operation from every angle to determine its value and place in our company fleet. For this, and other prudent business reasons, we have not made an outright purchase of the F-27. Instead we have it on a lease arrangement.

Raytheon owns only three planes outright. These are our Twin Beechcraft D 18 S, Beechcraft Bonanza, and a converted Douglas B-26, which is used primarily as a test bed for research and development rather than for passengers or company cargo. Our Lockheed Ventura is on a lease-purchase arrangement from Trans-International, Inc. of Miami, Fla., our Twin Beech E 18 S is leased from the Linden Flying Service, Linden, N. J., and our Piper Apache is leased from a local Massachusetts operator for approximately $40 per hour.

Business aircraft are often referred to as "executive planes." Our top executives do ride in our company planes, of course, but they are far outnumbered by our engineers, purchasing agents, staff specialists and supervisors.

While we have never made an exact analysis of the amount of time saved by personnel using company planes, we know that the principal users of our planes increase their productive working time by at least 20 per cent.

Without company aircraft we should need more senior executives—particularly in the engineering category—properly to supervise our growing and widespread activities. Their additional salaries would equal a large part of our air transport cost, even if the executives and other trained specialists could be found.

I might cite a personal example of time-saving. Once a month I have occasion to attend a directors' meeting in Bath, Maine. By using a company plane instead of the fastest scheduled airline or surface transport, I save a full half-day of working time.

Again, I am convinced that the low turnover among our engineers, many of whom have to do a lot of traveling, is partly due to the fact that regular use of company planes enables them to spend more time at home than they would otherwise enjoy.

Beyond this, for a company like Raytheon, which does 85 per cent of its $450,000,000 annual business with the military, security is a serious consideration. While it is true that classified documents are ordinarily transported by special couriers, there are occasions when our people must carry classified information in their briefcases for presentation in meetings. On company planes it is possible to study and discuss such material in flight without risking security.

Then, there is the fact that we keep our planes at the Bedford Airport, just a few minutes away from our Waltham

headquarters. To get to the Boston Airport for a commercial flight takes 45 minutes or more through traffic-choked city streets. We save untold hours of valuable working time—on all personnel levels—in this way alone.

There are allocation problems with company planes, of course, particularly in a company like Raytheon, which now has 38,000 employees. No company can afford enough planes to accommodate everybody wanting to use one. As our fleet has grown, and as our transport capability has increased, we have found that occasionally we fly more people than are absolutely necessary to do the job, just because seats are available. However, the great majority of our people are reasonable enough to demand a flight only when their business warrants it.

Our flight experience dates from the winter of 1946-'47, when we began to operate test aircraft in connection with anti-aircraft missile development. In those days we used one plane to simulate a missile and another a target. Then as now, we procured most of our test aircraft on bailment from the military services. However, it was for use in missile development that we purchased our first plane, a well-seasoned Lockheed Lodestar, and hired our first pilot, George Bottjer, an ex-Navy pilot. We also started to build up our own staff of aircraft mechanics, not only to service the test planes but to install the electronic gear we were developing.

With the acceleration of our flight equipment testing, the nose of our original Lockheed was changed more often than a woman's mind. We acquired another second-hand plane, a converted Douglas B-26 bomber. The Lockheed was pretty well worn out by this time, so we swapped it for a second-hand Beech Bonanza. It was with this plane that we first got into the air transport business, hopping our engineers mostly over to IBM plants in upper New York State and out to aircraft companies which had their own fields on Long Island.

As our defense business expanded, more and more of our people began to take trips to such places as Dayton, Ohio and Rome, N. Y. Airline connections from Boston to both these points were sometimes inadequate. In 1957 our Missile Systems Division took over a Navy plant in Bristol, Tenn., for production of the Sparrow III. Since our missile development center remained in Bedford, Mass., there was a great deal of traveling by our technical personnel between these two points, all of which added impetus to the growth of our air fleet.

With the addition this year of the F-27 we decided in order to get the full utility out of our fleet, to inaugurate scheduled operations, rather than let individual demands determine the flights. Some individual scheduling—particularly to smaller cities and in emergency situations—is still necessary, however, and will continue to account for a considerable percentage of our total miles flown.

Although we encourage all our people to use both company aircraft and commercial airlines whenever expedient or

(Continued on page 108)

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(Continued from page 107)

necessary, we never require them to fly. We carry insurance which covers all personnel in flight. The amount varies according to the individual's salary, but the minimum is $50,000.

Throughout industry, the safety record of company-operated planes compares favorably with that of the commercial airlines. Our record is no exception. In more than a decade of company air transport there have been very few accidents of any kind and no serious injury to our personnel. From the beginning it has been our policy to hire only the best pilots and mechanics we could find, and to insist that they maintain a rigorous inspection and maintenance program.

Including our chief pilot, George Bottjer, Naval Reserve four-striper, who has more than 9,000 hours of flying time, we have eight pilots. Larry Hayward, who heads up the transportation section of our flight department, is an ex-Air Force Lieutenant Colonel with over 15,000 hours of flight time. Bill Fiedler, an ex-Navy pilot, heads up operations for both our flight test and transportation sections. He has over 12,000 hours in jet and fixed-wing aircraft in addition to having served for five years with the CAA as a safety agent before joining Raytheon five years ago. Another of our pilots is an ex-Eastern Air Lines captain. In fact, three of our pilots are airline-rated and all the others have full commercial licenses.

In addition to these eight well-qualified pilots, our flight department has four maintenance supervisors, five mechanic co-pilots, eight mechanics, six metalsmiths, four electronics men, two radio men, and three administrative assistants.

We also employ, for use on our F-27, three part-time stewardesses. They are former airline girls, now married and living in the Boston area. They work, on the average, one or two days a week.

However, that these people—with the exception of the stewardesses—are not employed exclusively in the flight transportation phase of our activities. They also work on the installation and flight-testing of airborne electronic equipment under development for the military, using company planes as well as military planes procured on bailment.

At the Bedford Airport, where we are opening a huge new hangar and maintenance center this fall, with the most modern equipment, we do all of the work on our planes—both those owned by the company and those we lease—except for major engine overhauls. Engines are overhauled completely at the end of each 800 hours. This major engine overhaul work is contracted for on the outside. For example, Airwork, in Millville, N. J., handles our Pratt & Whitney 985s used on the Twin Beeches. Aces, at Miami, does the work on our Pratt & Whitney R-2800s, installed on our B-26 and the Lockheed Ventura. As yet, because it is so new, we haven't contracted for the overhaul of the turboprop engines on our F-27, but expect to do so shortly.

With this most effective maintenance program, we are getting a relatively high utilization rate for company-operated planes. For 1958, hours of utilization on each of our aircraft was as follows:

Lockheed Ventura	1038.4 hours
Twin Beechcraft D 18 S	896.9 "
Beechcraft Bonanza	305.1 "
Apache	327.7 "
Twin Beechcraft E 18 S	1040.5 "

Additionally, aircraft which we rented dry—with Raytheon supplying oil and gas and crews—accounted for another 100 hours of company flying time.

All of these flying hours were for transportation and not connected with testing or research and development.

Breaking these figures down further, we can get a more typical picture by analyzing the log book for 1958 of our Twin Beechcraft D 18 S as follows:

Number of flights scheduled	115
Number of flights completed	115
Number of flights cancelled	—
Hours flown	896.9
Miles flown	146,070
Number of passengers carried	512
Passenger miles flown	380,756

Total cost, in 1958, for the operation of this airplane—including everything—was $75,500, which breaks down to a cost per hour of operation of $84.

There is no doubt that our company-operated air transport system has proved itself a definite business asset and that it is here to stay. The F-27 appears to be a valuable addition to our fleet, but is, of course, too new for us to say exactly what role it will play. We intend to give big-plane transport several years of thorough trial in the hope that it will justify a permanent place in our operations. END

RAYTHEON'S F-27 FLIGHT SCHEDULE

With their new 18- to 22-passenger F-27 turboprop, Raytheon operates the following four-a-day-week scheduled service:

		Monday	*Tuesday*	*Wednesday*	*Thursday*
Bedford, Mass.	Leave	7:30 a.m.	7:30 a.m.	7:30 a.m.	7:30 a.m.
Washington, D. C.	Arrive		9:05 a.m.	9:05 a.m.	9:05 a.m.
Washington, D. C.	Leave		9:30 a.m.	9:30 a.m.	9:30 a.m.
Dayton, Ohio	Arrive	10:10 a.m.		11:15 a.m.	
Dayton, Ohio	Leave	10:30 a.m.		2:30 p.m.	
Bristol, Tenn.	Arrive	11:30 a.m.	10:45 a.m.		10:45 a.m.
Bristol, Tenn.	Leave	3:30 p.m.	3:00 p.m.		3:00 p.m.
Dayton, Ohio	Arrive	4:30 p.m.			
Dayton, Ohio	Leave	5:00 p.m.			
Washington, D. C.	Arrive		4:05 p.m.	4:00 p.m.	4:05 p.m.
Washington, D. C.	Leave		4:45 p.m.	4:45 p.m.	4:45 p.m.
Bedford, Mass.	Arrive	7:10 p.m.	6:00 p.m.	6:00 p.m.	6:00 p.m.

Atlantic Aviation

(Continued from page 56)

electronics has been so high that a number of manufacturers have come to Atlantic for advice.

About a year ago, the company was appointed distributor of the Grumman Gulfstream turboprop executive airplane. This launched it into the jet age with all its attendant complexities. The Gulfstream is a highly complicated aircraft compared to current types used in business flying. It is pressurized and its powerplants are vastly different from reciprocating engines; as yet there are comparatively few mechanics and technicians in civilian aviation who are thoroughly familiar with this newcomer to the business fleet.

This means that a company taking on the sale and servicing of a turboprop must train its personnel and set up complete facilities for maintenance of the aircraft. The Gulfstreams are delivered to Atlantic virtually bare, without interiors and with just enough instruments and radio to enable them to be flown to Wilmington from Grumman's Bethpage, L. I., plant. Cabin interiors, as well as electronic systems and instrumentation, are designed and installed by Atlantic in accordance with customer specifications. This involves a coordinated effort of the highest order on the part of interior design and electronics teams.

Atlantic was prepared for it. To supplement millions of man-hours experience in design and installation work, they purchased a tired DC-3 last year with some 10,600 hours of flight time and, after stripping it virtually to the bones, completely rebuilt and refurbished the airplane to the point where it is now considered one of the best customized DC-3s in the country. This exercise was a warm-up in preparation for the forthcoming Gulfstream work and proved to be an invaluable experience.

In the meantime ground service personnel have been attending the Rolls-Royce school in Montreal to train in maintenance and servicing of the Dart turboprop engines while the company's pilots were taking flight training at Grumman in order to check out Gulfstream purchasers' crews.

All work on the turboprop plane is under the supervision of division manager Don Redpath. Wilmington is the headquarters for Gulfstream sales, under the direction of vice president Richards.

The Atlantic Aviation system is dedicated to provide the best service for the money to business and private aviation. The operations range from aircraft sales, Beech and Gulfstream, as well as other makes taken in on trade, to complete maintenance and overhaul of planes from small single-engine craft to large twins, conversion and modification, cabin interior design, electronics, lease and charter of aircraft, flight training, proficiency check-outs, and an extensive parts service which is international in scope.

Aircraft sales efforts are tailored towards selling businesses on the use of airplanes most suitable to their require-

(Continued on page 110)

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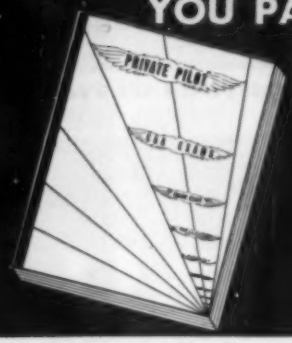

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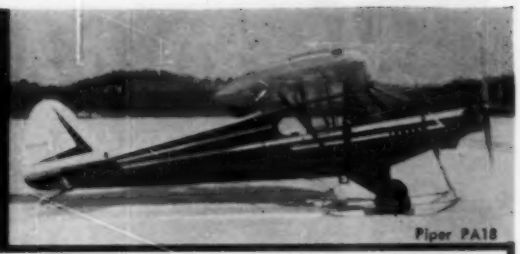

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(Continued from page 109)

ments. It is not a high pressure method but a well planned educational one which permits the customer to evaluate his needs without large capital outlay.

For this purpose Atlantic has a variety of aircraft types available for lease and charter. It is not uncommon that a concern having availed itself of this service, purchases a plane of its own. For those businesses which have need of aircraft but do not want to get involved in actual aircraft operation, Atlantic has a unique plan called Aircraft Administration, a package deal by which a company can lease or purchase an airplane with Atlantic providing crews, salaries, maintenance, etc., billing the customer monthly.

Aircraft financing is available through National Financing Inc., an Atlantic subsidiary. It covers practically every need and situation including pay-as-you-fly and pay-as-you-depreciate plans.

Flight training is another method of increasing airplane sales. Atlantic's flight training department has excellently equipped class rooms for ground school work and a Link trainer. Many students who have taken their flight courses have ended up buying planes. As a Beechcraft distributor, naturally interested in selling Beech planes, they have been experimenting in starting students directly in Bonanzas. Results, on the whole, are eminently successful, with students soloing in approximately the same time as it takes in lighter trainers. Atlantic's flight schools have courses available which range from single-engine to multi-engine and instrument ratings.

Lynchburg handles instruction for Virginia Military Institute, Air Force and Army ROTC. For the first seven months of 1959 Lynchburg provided 1,000 hours in flight training.

Atlantic's five divisions are almost autonomous and operate as separate companies. At the head of each is a divisional vice-president who makes all decisions directly concerned with the division's operation. Only in matters which may have a bearing on the policies of the entire system does he consult the home office in Wilmington.

The scope of operation of each division differs in certain aspects from the others and depends to a great extent on the aviation potential of the area served.

Four divisions, Wilmington, Philadelphia, Teterboro and Boston, have Beechcraft sales franchises. Gulfstream sales are handled from the home office in Wilmington with a representative at Teterboro. Wilmington and Teterboro, with the largest physical facilities, do all the heavy overhaul and maintenance, conversions and electronic systems work.

Philadelphia division, managed by Stewart M. Ayton, is a good example of how business increases when proper service is available. When Atlantic opened its base there three years ago, only 25 transient aircraft were serviced per month; now the number is 1,500 and still growing.

Philadelphia handles medium maintenance and overhaul, electronic trouble shooting, aircraft sales, lease and charter, and provides jet and turboprop fuel for

commercial jet and turboprop transports as well as for military jet fighters and trainers stationed at Philadelphia International airport.

Plans are in progress to expand the facilities by acquiring another large hangar adjacent to the present one and enlarging car and aircraft parking areas.

The Teterboro Division's two hangars serve New York metropolitan area and is the busiest of Atlantic's bases. "Nearly everybody in business aviation gets to New York sooner or later and most of them come to Atlantic," says V. E. Larimer, divisional vice president.

Business has been increasing on an average of ten per cent a year. Jet fuel is also available here in 20,000-gallon tanks recently installed. Teterboro can handle heavy maintenance, conversions and electronic work, in addition to aircraft sales and charter.

The Boston division, though small in comparison with the three main bases, is typical of Atlantic's dynamic concept in sales and service. Headed by ex-Navy pilot, John Erskine, it has since moving from Bedford, Mass., in 1952 sold 150 Bonanzas and 75 other aircraft. Erskine estimates that he and his two salesmen have called upon 3,500 to 4,000 companies in an effort to sell planes.

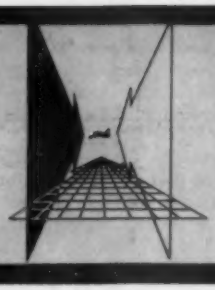
Boston division also does a considerable amount of charter work through New England and light maintenance work up to twin Beechs. Because of Erskine's missionary work, New England's acceptance of business aircraft is much greater today.

The Lynchburg operation is at grassroots level and consists of charter work, flight training, used plane sales, and service of local and transient aircraft. Atlantic's present facilities consist of an office and three hangars. Transient business traffic has been increasing and presently averages 500 aircraft a month. The Lynchburg setup is a typical small fixed base operation and keeps Atlantic Aviation close to the basic problems of the smaller operators with whom it does considerable business. Scheduled for completion in the near future is improvement of the facility including a terminal building and extension of runways.

Atlantic Aviation, which 32 years ago started as an industrialist's hobby, has grown into a multi-million dollar business. During this period it has made a substantial contribution to business flying by providing for and anticipating its needs in ways normally not expected of a fixed base operator.

An important factor in Atlantic's growth is undoubtedly the keen aviation interest and vision of its founder. This interest is responsible for a basic Atlantic Aviation principle—in business aviation only the best is acceptable. Solidly backing this belief are Atlantic's Board of Directors, Divisional Vice-Presidents, operations managers and employees.

There is a continuous effort based on sound business practices, to improve and expand the facilities in order to keep pace with increasing business, prepare for the coming jet age in business flying and for whatever the future may bring ten years from now. Atlantic guesses that it may be 75,000 business aircraft! END



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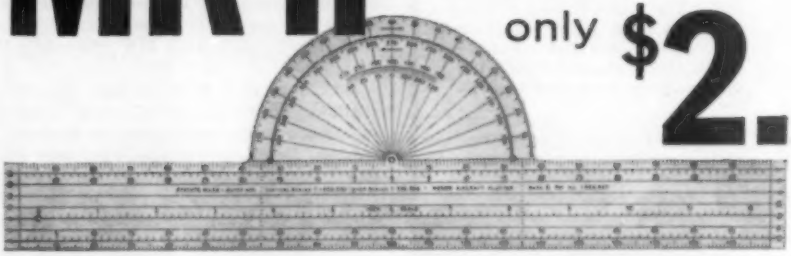

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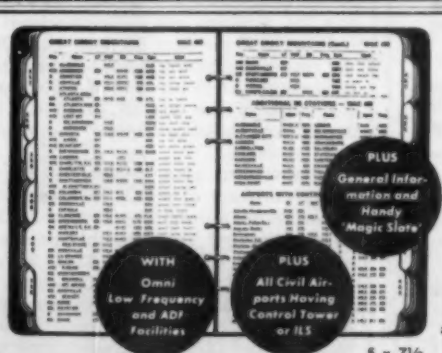

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(Continued from page 49)

depreciation method most favorable to individual companies. And lease payments are fully deductible as business expenses.

Beech Acceptance Cprporation's number one finance plan is designed for use with the "straight line" or equal payment method of depreciation, permitting earnings on tax savings at a constant rate. It requires a down payment of 25 per cent with 48 months to pay off the balance. Thus the depreciable amount (aircraft cost less residual value) is divided by the number of years of the plane's "useful life." Over a five-year period, each year's depreciation would be 20 per cent of the total depreciable amount.

The basic list price of the 1959 Beechcraft Bonanza is $23,300. Under the straight line plan, the down payment would be $7,338 with equal monthly payments of $568.59, including hull coverage, spread over four years. Cumulative tax savings earned by corporations in the 52 per cent bracket would figure 8.3 per cent the first year; 16.6 per cent, second year; 24.9 per cent, third year; 33.2 per cent, fourth year, and 41.6 per cent the fifth year.

BAC's second plan, a sum of digits method, allows tax savings to be earned at a more rapid rate during early depreciation. Down payment is 20 per cent and the obligation, 36 months. Annual depreciation is computed by adding the digits of the years of useful life which, over a five-year period, equals 15. Thus, the first year's rate would be 5/15ths of the depreciable amount. The annual savings in succeeding years then would be 4/15ths, 3/15ths, 2/15ths and 1/15th of the total depreciation.

On a Beechcraft Travel Air, priced at $51,500, the amount of digits plan requires $10,300 down. Monthly payments the first year amount to $1,869.45; the second year, $1,454.87, and third year, $1,032.58. Cumulative tax savings are 13.9 per cent the first year; 25 per cent, second year; 33.3 per cent, third year; 38.6 per cent, fourth year and 41.6 per cent by the end of the fifth year.

An even faster accumulation of tax savings is possible under the third plan, which uses the declining balance method of depreciation. This plan also requires 20 per cent down and 36 months to pay, but the airplane can be depreciated at the rate of 40 per cent the first year. During succeeding years, annual depreciation is computed at 40 per cent of the remaining value of the aircraft, until the undepreciated balance equals the plane's residual value.

In the third plan, companies can finance purchase of a $122,500 Beechcraft Super 18 for a down payment of $24,500. During the first year, monthly payments are $5,089.87; second year, $3,050.25, and third year, $1,960. As on all Beechcraft models, cumulative tax savings on a Super 18, computed by the declining balance method, would be 20.8 per cent in the first year; 33.3 per cent, second year; 40.8 per cent, third year, and 41.6 per cent in both fourth and fifth years.

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Security payment of an $80,500 Beechcraft Twin-Bonanza, is $6,037.50 under the four-year plan. Monthly payments, which include hull coverage and liability insurance, are $2,858.70 the first year; $2,625.25 the second year, and $1,610.95 in the third year. During the fourth year, the 37th and 38th payments amount to $878.40, and the 39th through the 48th—$603.75. After the 38th monthly payment, the balance due on the option to buy totals $10,465.

"These four-year transactions have enjoyed a healthy growth, but during recent months we've received numerous requests for a more simplified, equal payments lease arrangement of longer maturity," Bell says. "As a result, BAC has developed a new plan extending payments over five years. Under it, the lessee may purchase the airplane at any time up to the 48th month or cancel his lease at any time before its expiration date."

BAC's new five-year deal requires an initial security deposit of 15 per cent of the airplane's retail sales price. This fee is later applied to the 60th rental payment. As an added feature, full credit for the 15 per cent deposit on the original contract is given on a second lease of a like model airplane having equal or greater dollar value, provided the follow-up agreement is consummated within 30 days of the first rental period's expiration date.

Again using the Twin-Bonanza as an example, the five-year plan would require a security deposit of $12,075 and 60 equal payments of $1,618.21, which includes hull coverage and liability insurrance. Should the lessee choose to buy, his security deposit would be credited against the cost of the airplane at the time he exercises his purchase option. Otherwise, the $12,075 deposit would be

(Continued on page 114)

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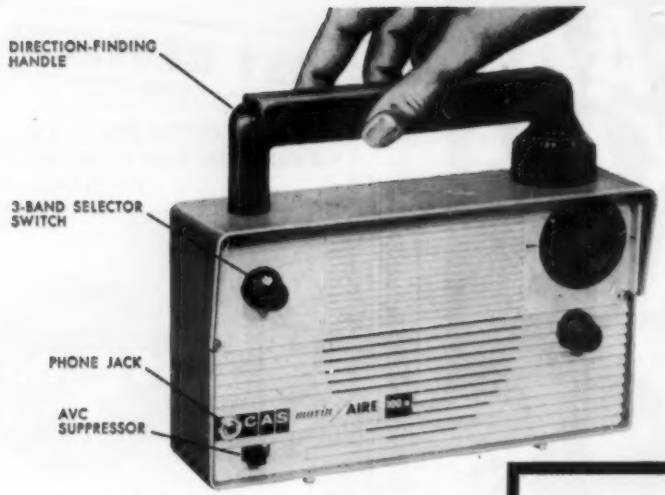

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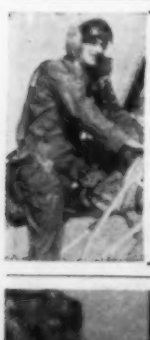

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(Continued from page 113)

used to pay the balance still due on the lease.

A pioneer in the field, Beech became the first commercial aircraft manufacturer to offer business plan financing and leasing at the customer level. Besides the United States, including Alaska and Hawaii, the subsidiary does business in Canada and Puerto Rico. It maintains home offices at the Beech factory in Wichita.

Officers and board members include Mrs. O. A. Beech, chairman; John P. Gaty, director; Frank E. Hedrick, president and director; A. R. Bell, vice president, director; John A. Elliott, secretary-treasurer, director; Edward C. Burns, assistant secretary and a director, and Leddy Greever, Michael G. Neuburger and Dwight S. Wallace, directors. All except Bell also hold top management positions with the parent company, Beech Aircraft Corporation.

By far the largest single segment of general aviation, business planes flew 5,500,000 hours last year—nearly 2,000,000 more hours than all the domestic airlines combined. This usage represents a 150 per cent increase in the past decade; 75 per cent in the past five years. Moreover, the present executive fleet of some 30,000 airplanes is expected to double before 1975. And in step with the boom is the potential market for aircraft financing.

Today, more and more banking houses are following the example of Beech and other companies by establishing their own commercial aircraft credit departments. Even the most conservative financing organization now recognizes the airplane as an essential business tool which, if denied, could conceivably impair the nation's industrial economy. Executive flying has come of age! END

Straw in the Wind

(Continued from page 52)

chief of Aircraft Sales-Fort Worth and Bill Fate continues on top at Aircraft Sales-Longview.

To cool off the smoking grapevine, that had big Southwest Airmotive ruthlessly gobbling up almost everyone and everything, Jim Craddock called a hurry-up meeting of the dealers and assured them that the status quo looked good from where he sat. He admitted he was present to get help and advice, not to give it.

Thus Southwest Airmotive found itself with some darn good airplanes to sell. Now, how to do it!

First off, they dreamed up a mammoth, Hollywood-type premiere showing for the 1959 line of Cessnas. This was a unique dual effort with Dal-Tex, the latter generously pitching in, despite the affair's being held on the property of No. 1 competitor, Southwest Airmotive. Letters of invitation, signed by Harlan Ray and by Dal-Tex owner W. T. Overton (another prominent name in civic Dallas), brought out several hundred of the city's leading executives, for the most part men who'd never before been aware of any kind of private plane debut.

In a blaze of kleig lights, SAC and Dal-

(Continued from page 114)

Tex wined 'em, romanced 'em with decorations and a full-size orchestra, entertained 'em with a big floor show and, at long last, brought out each new Cessna from behind a velvet curtain. The airplanes were equipped complete, each with a Neiman-Marcus mannequin, and were towed into view by top-hatted, white-tied young men. This is where SAC started learning things the hard way. The show was great except the evening waxed too long and some of the VIP's yawningly toddled off to bed ere a single Cessna nosed into view from behind that wonderful blue velvet curtain.

In any event, television, radio and newspaper coverage jolted the community as never before with the news of a real four-bell airplane party. SAC had done essentially what it set out to do—make Cessna business airplanes look and sound important!

What started as simply a Cessna sales and service mission soon blossomed into a full-scale "air age package for businessmen," as SAC terms it today.

John Clement, ex-professional football star and ex-B-36 commander, was employed to operate a charter and lease service tailored to the needs of businessmen and sportsmen. SAC officials frankly were pessimistic about the charter service—over the years, they'd had many a flying friend who had lost his last sou in just such an enterprise. Nonetheless, bucking that Dallas line as he once did as a Pittsburgh Steeler halfback, Clement soon became a favorite with businessmen who previously went places only by Cadillac or Pullman.

Next on the agenda was a flight school. SAC didn't propose to make money in the school business—it wanted to create a kind of captive audience for its airplane sales pitch, in a feeling that if they learn to fly they must have something to fly in—and, by the way, why not one of these nice, new Cessnas? As the school's prexy, Southwest employed Jim Bellamy, a Naval Academy graduate and a veteran ground and flight school instructor with a large reputation in the Dallas-Fort Worth neighborhood.

Proof of the pudding is seen today in the type students attending "Bellamy Institute," as they call it. They include company presidents, salesmen of many varieties, engineers, geologists and even a sprinkling of wives who have come along to share their husbands' new interests. In age, they go up to almost 60 years. Without exception, they consider learning to fly a serious matter.

The businessman's course includes 20 hours of ground school and 40 hours in the air. Ground school is held once a week, at night, at Southwest Airmotive. Love Field is used as a rendezvous point for flight student and instructor; practice landings and take-offs are made elsewhere on a non-airline airport.

Another item in the air age business package is a scheme that Jim Craddock came up with and that may turn out to

(Continued on page 116)

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1939 LAPORTE AVENUE • FORT COLLINS, COLORADO

Dealership Franchises Available

(Continued from page 115)

be a dandy once he "unbusies" himself sufficiently to get it off the ground. This is a business airplane evaluation course to familiarize the businessman with a modern airplane and with the ground facilities available for its safe, convenient operation. The course is a one-evening affair and includes a brief flight over Dallas-Fort Worth, with accompanying layman's-level talk about the plane and its equipment. A stop is made at Amon Carter Field where guests are shown the control tower and the radar room and the trip ends with candlelit dinner at SAC's glamorous Flight Deck Restaurant. A charge of $15 takes care of three persons in a new Cessna Skylane.

The company has great confidence in the Cessna-developed "Value Per Mile" formula which determines with mathematical accuracy a company's or individual's need for business air transportation. It has pushed this as a spearhead of its entire sales effort, as have dealers everywhere.

Supporting SAC's Cessna offensive is a continuing, full-scale advertising and public relations program to convey ideas and concepts, rather than selling specific airplanes in the traditional classified ad. A recent series more nearly resembled an editorial aviation column and dealt with the anecdote and example of business flying, as well as with the doctrine. These were followed by small teaser-boxes inserted in oil, business, women's and sport sections of the papers. Example: "Wives—Are You Standing In The Way Of Progress?" Now the company is featuring case histories of Cessna airplanes at work in the hands of North Texas businessmen.

In reality, these ads—appearing in newspapers in Dallas and Fort Worth—aren't SAC's at all. As a bonus gesture of support to its dealers, Business Wings, the distributor, foots the bill and includes the names of several dealers in each ad.

Simultaneously, Southwest daily provides a Cessna in which a local 50,000-watt radio station sends a reporter aloft for remote traffic-patrol broadcasts during the hazardous homeward-bound period from 4:30 p.m. to 5:30 p.m. In return, SAC's business air package is plugged repeatedly.

Closing in on that new market, SAC, Dal-Tex and Aircraft Sales have co-operated in several business airplane forums presented before downtown luncheon clubs. Door prizes have included business airplane evaluation courses and 500-mile overnight charter trips.

And so, in the broad and often vague area of "new market conditioning," Southwest Airmotive, in little more than a year, has pioneered its way up with commendable foresight and courage. The continuity and caliber of its endeavors are unusual, to say the least. SAC has a lot to learn, for airplane selling is an art best acquired by experience, but observers feel that eventually it will emerge with a sales scorecard at or near the top of the list.

As SAC president Harlan Ray says: "It's a good feeling to be selling airplanes again—makes us feel that we're sure enough back in aviation!" END

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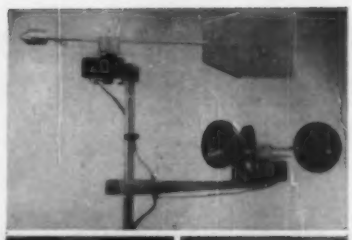

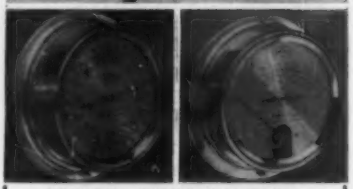

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HERTER'S AIRCRAFT DIVISION
WASECA, MINNESOTA

I Learned About Flying

(Continued from page 68)

trying to dodge clouds. They had lowered earlier than expected, and my cruising altitude of 6,000 feet dropped to 4,000, leaving only 1,000 feet between the peaks and the plane. The decision of lowering my altitude further or making a 180 faced me. On the other hand a new course of 150 on instruments would bring me over the rocks to the open country in just ten minutes. I bought that idea and headed to the right. After penetrating the first cloud, I broke out and returned to VFR, but soon I had to adjust myself quickly to instruments again. In ten minutes, however, I caught glimpses of level ground well below and dropped to 3,000 feet. Clear of mountains, clouds and problems. But I was not home yet!

The ceiling soon became a solid overcast at 4,000 feet and I descended to 2,500, keeping good ground contact, but OMNI reception became difficult. I was just 30 minutes from my fuel stop—Charlottesville. A few nasty black thunderheads lay to the right and one lay very close to my destination.

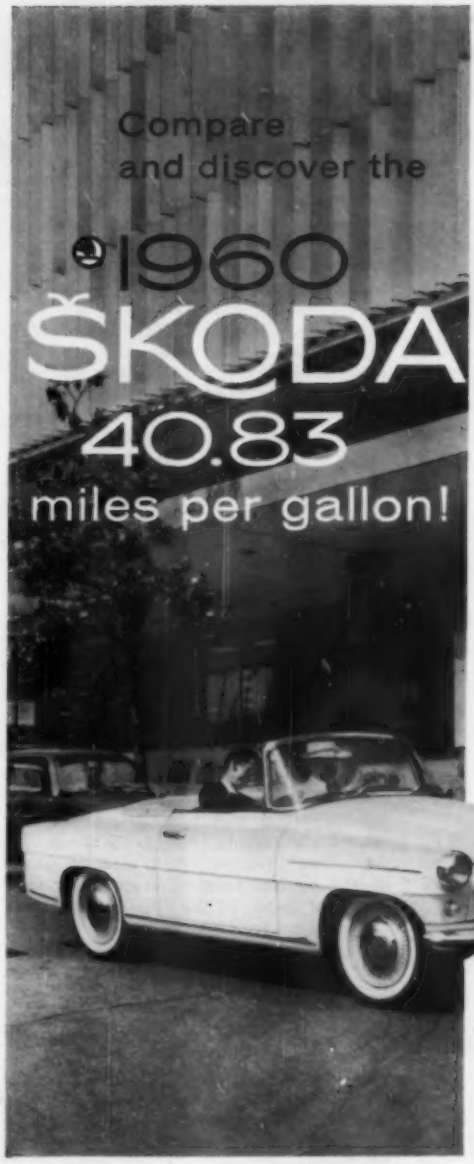
Approaching Charlottesville, I started to let down, planning to sneak in underneath the huge black cloud which sat between me and the airport. Suddenly I heard a "whoosh" and my plane was sucked up into the whirling mass. Pulling carburetor heat, closing throttle and nosing down the plane was one thing. Holding an angle of more than 45 degrees, I still felt the plane and my hair rising and I jammed the controls into the instrument panel. Ahead was a small summit ridge, with a steep cliff on the opposite side and I really dove over this cliff, banking away from those gripping claws that tried to pull me up, just 5,000 feet from the airport! Over the ridge, my speed finally picked up and, advancing throttle, closing carburetor heat, I pushed the plane ahead.

Only about 300 feet of altitude remained and, nearly brushing the wet tree tops on the outskirts of Charlottesville, I eased up to 500 feet, but with a very uncomfortable heading towards the mountains with no hope of climbing over them.

A very shallow right turn gradually straightened out my course, paralleling the mountains. As a guiding light I watched the bright blue gap ahead. On one side of the solid rocks which I could not outclimb, on the other the whirlpool with thunder and lightning, moving slowly but steadily to encompass me.

Thirty minutes later, I relaxed, knowing that I would make it. There was no airport on my route in which to land and I had to outfly it. After passing this point with only a few hundred feet between the clouds and my right wing tip, I gradually climbed back to a more comfortable altitude and searched for a fuel stop. Finally, in back of the thunderstorm, Winchester airport appeared at the entrance to the Shenandoah Valley, and I landed with only 20 minutes gas left.

After refueling, I flew home easily to New Holland Airport. How much flying experience I had gained in a few hours! Plus a new respect for mountains! END



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On June 16, 1959, a driver and an observer threaded a 1960 ŠKODA through freeways, boulevards and streets for two hours in one of the world's most congested cities to set a new record for economy.

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This is a surprising automobile. The product of a 100-year-old industrial giant, the 1960 ŠKODA has engineering features (aluminum engine block, clutch and transmission housing, dual carburetion, vinyleather interiors, for example) Detroit promises 5 years from now. You ought to see and drive the 1960 ŠKODA before buying any automobile, imported or domestic.

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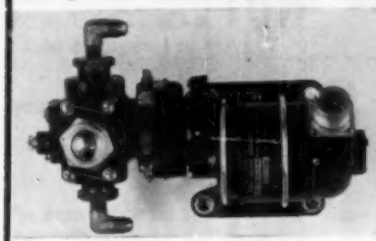

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The Ayer Story

(Continued from page 59)

customers wouldn't think they were dealing with a callow youngster, and changed the name of his company to Trade-Ayer. These were the immediate postwar years when governments all over the world were unloading or looking for war surplus aircraft. Ayer decided to go after some of that market and did it by the time-honored sales method of specializing in one particular product, the AT-6, a single-engine military trainer.

After arranging with Spartan Aircraft to overhaul the planes, he started a world-wide hunt for AT-6s, shipping them to Spartan's plants before selling them, usually to South American governments. On one of his hunting forays, he found 15 English-owned AT-6s on an abandoned airstrip in Southern Rhodesia. Hiring natives, he stripped the planes down, loaded them on groaning flat cars and transported them 500 miles across South Africa to the sea.

Late in 1949, in the midst of his AT-6 operations, Ayer moved his headquarters to the larger and better equipped airport at Linden, N. J. Here shipments such as the South African planes could be trucked from the port at Newark through city traffic to the Trade-Ayer base of operations.

By the end of 1954, Fred Ayer had sold 446 planes, 252 of them trainers, and had considerably upped his net worth. The operation was a going concern. In addition to buying and selling planes, he was now directing conversion of many of the twin-engined aircraft he had in stock for resale in the corporate market. During this period he handled Venturas, Grumman Goose and Widgeon amphibians, DC-3s, C-47s and C-46s, PBYs and lighter aircraft.

Ayer was now dealing in large sums of money, for even war surplus aircraft were not cheap and the corporate market was growing rapidly. A number of his transactions attracted New York financial interests. Through them, he was able to develop financing and lease programs for his customers.

By 1958, just 12 years after making his first $150 profit on an aircraft sale, Fred Ayer had upped his worth to more than $1,250,000. And the airlines were talking about selling their piston-engine fleets to make way for jets and turboprops.

Here was a ready-made, specialized market—and Ayer intended to take it. Getting the nod from his backers, including a major New York bank, he sold the large hangar and office at Linden, moved across the Hudson to Manhattan where he set up a new company—Frederick B. Ayer & Associates, Inc.

On September 9, 1958, Ayer contracted to purchase 24 of American Airlines' Convair 240s. At 30, Frederick B. Ayer had become the world's largest aircraft dealer.

To understand Ayer's aggressive program for selling his gigantic fleet as fast as he acquires it, one must first recognize that these planes are very high quality merchandise, carefully and expensively maintained by the airlines. To match this quality, Ayer and his associates—a group of specialists in everything from engineering to international ferrying operations—present a prospective customer with a complete service facility, from provisions for pilot training to sources of spare parts; from progressive maintenance programs to financing or lease arrangements.

Originally Ayer thought that about a third of the Convairs would go to the business fleet, a third to feeder airlines in the U. S., and a third abroad. However, U. S. demand has been so strong that foreign sales have been neglected. The reverse probably will be true with the DC-6, the majority of sales going outside the U. S. Meanwhile he has opened a South American office with headquarters in Nassau, BWI, and intends to have a European office in the near future.

The domestic DC-6 market, Ayer says, will be essentially a leasing operation to meet airline needs during heavy seasonal peaks, and some sales to supplemental air carriers. "Maybe six to ten of the DC-6s," he adds, "will go into the corporate market, mainly to large companies who do extensive overseas flying and also want a large plane for a flying showcase."

All this is going to bring down the price of smaller and older planes. "It's like musical chairs," Ayer explains. "As one man buys a Convair, his DC-3 becomes surplus and will be on the market for $125,000 to $175,000. This opens an entire new area of operations to smaller corporations who couldn't afford the previous $250,000 tag. And the musical chairs will keep on going . . . purchase of a DC-3 will make an Aero Commander or a Beech or Cessna surplus, and so on down the line. It's all going to have a big stimulus on business flying."

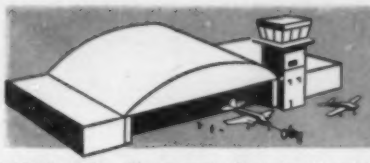
Ayer's intention, though, is to deal mainly with bigger planes. "Of course," he notes, "we'll have to take a DC-3 or some other plane in trade for a Convair or DC-6, but we don't intend to be buying fleets of DC-3s. Somewhere down the line, we'll have to wholesale the planes out. We haven't decided exactly where yet."

Putting in 80 to 90 hours a week in his large and newly-and-expensively designed offices at 250 Park Avenue in New York, Ayer has moved out of the small-time aircraft brokerage business into an area where millions of dollars are at stake. But in this new and still untested field, he finds less danger and more profit than in his former dealings in AT-6s and smaller craft.

He sees a huge and steady market for the aircraft he will get from American and other lines. "After all," he notes, "we're not going to wake up one Monday morning with 80 or more planes on our hands to sell that minute." They will be phased out of the airlines slowly and Ayer does not expect delivery on the final plane of the American fleet for at least 36 months.

Right now, he claims, demand for Convairs, the only plane he has yet received, far exceeds supply, while demand for DC-6s should be about the same.

"The future," he declares, "is just beginning. There are going to be piston-engined planes to sell for a long time, in fact as long as we can see ahead." END



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10 AVAILABLE. All models. 1952, five-place Model 520, #FQQZ/BF, has 365-hour remanufactured engines. Newly painted and reupholstered. Excellent radio including Collins 90-channel transmitter, ARC15 omnirange, ADF-14. Relicensed May. Clean. Bargain. $31,200. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting."

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1958 BELLANCA Cruisemaster. 150 Hours TT aircraft and engine. Full Panel, Superhomer. $11,300.00. Palm Beach Aviation, Inc., P. O. Box 8595, Lantana, Florida. Phone Justice 5-1379.

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3 AVAILABLE. Painted, 1956, #XQF/F, has 630 total hours. Engines 630 and 380 hours. Gyros. Omnirange. ADF-12. Hangared. Undamaged. Relicensed June. Bargain. $15,900. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting."

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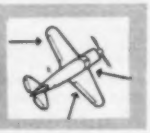

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Advertisers' Index

ADVERTISER	PAGE NO.
AC Aircraft Spark Plugs	75
ASL	78
Acme School of Aeronautics	109
Aero Design & Engineering Co.	85
Aero Developments	114
Aero Insurance Agency	106
Aero Mechanics School	112
Aero Products	111
Agreters, Inc.	94
Air France	9
Aircraft Finance, Inc.	114
Aircraft Radio Corporation	25
Airport and Business Flying Directory	106
Airtex Products	80
Alpha Corporation	3rd Cover
American Airlines	29
American Flyers Incorporated	80
Atlantic Aviation Corporation	86
Audit Bureau of Circulations, The	112
Aviation Photo Exchange	96
B & H Instrument Co., Inc.	7
Baseh Co., George	113
Beech Aircraft Corp.	69
Bendix Radio Division	71
Benson Aircraft Corp.	118
Berlow & Co., Inc., Richard J.	108
Borum Seats, Inc., Otis C.	102
C. A. S. Manufacturing Co.	114
Cessna Aircraft Company	5
Champion Aircraft Corp.	98
Champion Spark Plug Company	19, 20, 21, 22
Collins Radio Company	4th Cover
Combs Aircraft	88
Copters Unlimited, Inc.	114
Custom Enterprises	104
Daniels Aircraft, Jack	117
Dave's Army & Navy Store	118
Desert Air Hotel & Resort	94
Don Juan Watch Bands	76
Downer Aircraft Industries, Inc.	105
Du Pont Aircraft Service, Inc.	96
Electric Power Door Co., Inc.	82
Embry-Riddle Aeronautical Institute	74, 95
Esso Aviation Products	2nd Cover
Fairchild Engine & Airplane Corporation	14, 15
Federal Ski and Engineering Corp., The	110
Florida Aircraft Radio & Marine, Inc.	90
Flying Book Service	81
Flying Equipment Sales Co.	102
Flying Movies	116
Flying Subscriptions	108
Flynn, Dr. John T.	110
Forney Aircraft Co.	115
Fruhauf Southwest Uniform Co.	114
Gabb Special Products, Inc.	96
Gem Aircraft, Inc.	109
Gluckmann Aviation Company	118
Goodyear Aviation Products	3
Graubart Aviation, Inc.	112
Greenwich Book Publishers, Inc.	106
Grumman Aircraft Engineering Corporation	72, 73
Gull Model Airplane Company	82
Hampton Books	114
Hertler's Aircraft Division	116
Indiana Technical College	108
Insurance Company of North America	104
Jay's	108
Jeppesen & Co.	6, 89
Kane Aero Equip't.	24
Kent Limited, George	88
Lear, Inc.	63
McCauley Industrial Corporation	103
McConnell Airline School	112
Manger Hotels	100
Meyers Aircraft Co.	86
Mitchell National Sales	78
Mooney Aircraft, Inc.	83
National Aeronautical Corp.	12
Northrop Institute of Technology	8, 92, 101
Nova-Tech, Inc.	16
Pan American Navigation Service	18
Parks College of Saint Louis University	99
Phillips Petroleum Company	83
Photography Directory	121
Piper Aircraft Corporation	13
Puritan Compressed Gas Corporation	98
Radio Corporation of America	23
Remmert-Werner Inc.	102
Republic Aviation	87
Ross Aero Publishers	113
Ross School of Aviation	113
Safe Flight Instrument Corporation	91
Scott Aviation Corp.	107
Sensenich Propellers	82
Shannon School of Aeronautics, Inc.	110
Shell Oil Company	26, 27
Skycraft Design	80
Skyhopper Airplanes, Inc.	94
Socony Mobil Oil Company, Inc.	11
Southwest Airmotive Company	78
Southwestern Industrial Electronics Company	90
Spartan Aircraft Company	67
Spartan School of Aeronautics	77
Sphinx American	116
Standard Oil Company of California	79
Stits Aircraft	96, 112
Survival Equipment Company	112
Teterboro School of Aeronautics	106
Townsend Engineering	110
U. S. Air Force	97
U. S. Transport and Business Aircraft	88
Van Nostrand Co., D.	84
Varsity Shop Specialties	90
Vest Aircraft Co.	90
Vest-Matteon III. Co.	106
Weems System of Navigation, Inc.	111
White & Sons, Inc., W. O.	116
Winslow Aerofilter Corporation	17
Witkin, Inc., Willy	117
Weld Associates, William C.	116
Zahns Airport	104

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(Continued from page 10)

considerations of executive and private flying. Equipment available ranges from the Cessna 172 to DC-3 and pilot ratings from private to ATR.

AN ALL-PLASTIC agricultural spray unit, consisting of a 30-ft. spray boom and 110 Imperial-gallon tank, has been developed in Britain by Rediweld Ltd. of Crawley, Surrey, England. Claimed to be

non-corrosive, it offers advantages in rigidity and maneuverability. It gives a 100-ft. coverage on each run and treats 68 acres an hour. The "chopper" is a Sikorsky S-55.

LATEST AIRCRAFT RADIO CORP. entry into the market is the ARC Type T-25-A Transmitter, a 360-channel, electrically tuned, crystal-controlled, 6 to 10 watt (8 watt nominal) VHF transmitter. Operating on any 50 kc channel between 118.0 mc and 135.95 mc, the instrument is designed for use in any aircraft as the primary VHF transmitter. The A-25A is certified to FAA TSO C-37 Category A, FCC requirements and U. S. military agencies.

SLIP COVERS of vinyl-coated nylon to protect the movable surfaces of an aircraft against frost, ice, snow and hail are a recent development of Stoll Manufacturing Co., Denver 5, Colo. The fabric, a product of Herculite Protective Fabrics,

Newark, N. J., is lightweight, water and shrink proof said not to mildew or support flames. Covers are fitted to surfaces and are open at one side. Elastic cord and "S" hooks are attached through grommets to hold covers in place.

MEMPHIS, TENN., has added a third airport, of a size suitable for planes in the DC-3 capacity. Located on Mud Island, where a free ferry ride across Wolf River puts passengers within a five-minute walk of downtown Memphis, this new facility called Memphis Downtown Airport offers a 3,100-foot hardsurfaced runway, fuel service, hangar; and no landing fee. Its sponsors claim it to be "the closest landing strip to any metropolitan area in America."

UNDER ITS OWN TRADE NAME, Cessna Aircraft is marketing new dry charged batteries designed especially for the company's line of aircraft. Available through Cessna's distributor-dealer organization, the new batteries carry an 18-month prorated guarantee, as compared to a 12-month guarantee previously offered on batteries sold by the company.

THE APPOINTMENT of Mr. Carl Wooten as a vice president of the L. B. Smith Aircraft Corp., International Airport, Miami, Fla., has been announced. With Aero Design and Engineering Co., in Bethany, Okla., for a number of years, his most recent connection was with Trecker Aircraft at Milwaukee, Wis.

FOR A QUICK, POSITIVE check for possible mechanical failures in aircraft components between flights, Magnaflux Corp., has developed a new low-cost portable testing kit—the Zyglo ZA-43. A highly fluorescent penetrating liquid, Zyglo is

used to coat surfaces of any solid material requiring inspection. A black light which comes with the kit brings out any imperfections. For further information write Magnaflux at 7300 W. Lawrence Ave., Chicago 31. Price of kit complete is $125.

PAUL VANCE of St. Louis, for the past eight years executive pilot and senior sales engineer for the Aviation Fluids Section of Monsanto Chemical Co., and widely known in local and national aviation affairs, is the new vice president of marketing for General Aviation Supply Co. of St. Louis.

THE FAA has proposed that all aircraft certificated under transport category rules and carrying passengers shall be equipped with airborne weather radar. The proposed rule would amend parts 40, 41, and 42 of the Civil Air Regulations. Copies of the proposal FAA-59-#54 are available from FAA. Closing date for public comments is Oct. 8, 1959.

USING A STOCK Piper Apache, shorn of one propeller, Dick Jagitsch, sales manager of Arkansas Aviation Sales, Little Rock, Ark. Piper distributor, set out August 1 to set a new non-stop world record flying a twin-engine airplane with one engine out. The record aimed at was that of Victor Stadter of McAllen, Tex.,

which was 1,248 miles. Flying for 12 hours and 26 min., Jagitsch in his "Arkansas Traveler" flew to a new record of 1,304 miles, dodging thunderstorms over his prescribed route. Little Rock to Ft. Smith, to Texarkana, to El Dorado, to Pine Bluff (Ark.) to Memphis, Tenn., then to Little Rock twice.

WHETHER YOU FLY a jet or "Cub" you will be interested in Jeppeson's new CR Computer Manual/Workbook designed for use with all models of the Jepco CR Computer (R-1, R-2, R-2t, CR-2 and CR-3). Effectively illustrated; organized and written by Alice Fuchs, pilot and aviation writer, the book simplifies techniques for using the CR Computer and also provides instruction material for additional uses and short-cut methods for certain problems in air navigation. At all dealers, $3.

TV'S CHARLIE WEAVER, "Mount Idy's" favorite son and Cliff Arquette in private life, swapped a guided tour of the historic battlefield at Gettysburg, Pa., for a flying lesson with WIP (Pittsburgh) newscaster Paul Parker (left). Parker,

who regularly pilots his own plane on news-gathering chores had flown in from Ambler, Pa., where he bases his Cessna 172 at Wings Field. "Charlie" lives in Gettysburg and operates "Old Soldiers Home," a Civil War Museum, when he's not on the airwaves.

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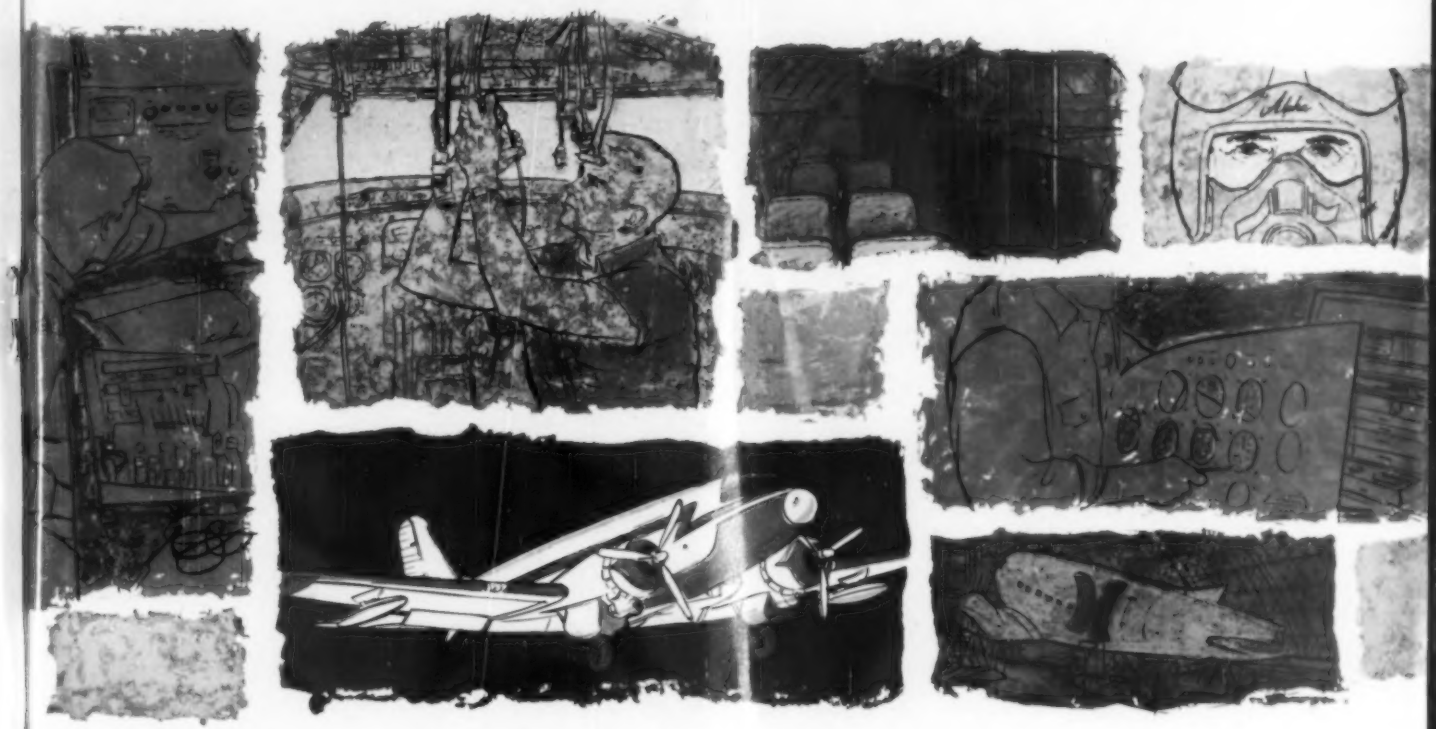
AIRCRAFT MODIFICATION



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